Rosewill®

Wireless Router RNX-G40

User Manual

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
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IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment
should be installed and operated with minimum distance 20cm between the radiator & your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Contents

TERMINOLOGY ----------5

1.INTRODUCTION----------6

1.1 PACKAGE CONTENTS----------6

1.2 PRODUCT SPECIFICATIONS----------6

1.3 PRODUCT FEATURES ----------7

1.4 FRONT PANEL DESCRIPTION ----------8

1.5 REAR PANEL DESCRIPTION ----------9

2.INSTALLATION ---------- 10

2.1 HARDWARE INSTALLATION---------- 10

2.2 SOFTWARE INSTALLATION ---------- 10

3.SOFTWARE CONFIGURATION ---------- 11

3.1 PREPARE YOUR PC TO CONFIGURE THE WLAN AP ROUTER ---------- 11

3.2 CONNECT TO THE WLAN AP ROUTER---------- 13

3.3 MANAGEMENT AND CONFIGURATION ON THE WLAN AP ROUTER ---------- 13

3.3.1Status---------- 13

3.3.2Setup Wizard---------- 15

I Operation Mode ---------- 15

II Time Zone Setting ---------- 16

III LAN Interface Setup---------- 16

IV WAN Interface Setup ---------- 17

V Wireless Basic Settings ---------- 17

VI Wireless Security Setup ---------- 18

3.3.3Operation Mode---------- 18

3.3.4Wireless - Basic Settings---------- 19

3.3.5Wireless -Advanced Settings ---------- 20

3.3.6Wireless - Security Setup ---------- 22

I WEP Key Setup ---------- 24

3.3.7Wireless -Access Control ---------- 25

3.3.8WDS Settings ---------- 26

I WDS Security Setup---------- 27

II WDS AP Table---------- 28

3.3.9Site Survey ---------- 28

3.3.10 LAN Interface Setup---------- 29

3.3.11WAN Interface Setup---------- 30

I Static IP---------- 30

II DHCP Client ---------- 31

III PPPoE ---------- 32

IV PPTP---------- 34

3.3.12Firewall - Port Filtering ---------- 35
3.3.13Firewall - IP Filtering---------- 36
3.3.14Firewall - MAC Filtering ---------- 37
3.3.15Firewall - Port Forwarding ---------- 38
3.3.16Firewall - URL Filtering---------- 39
3.3.17Firewall - DMZ ---------- 40
3.3.18Management - Statistics---------- 41
3.3.19Management – DDNS ---------- 42
3.3.20Management - Time Zone Setting ---------- 43
3.3.21Management – Log---------- 44
3.3.22Management - Upgrade Firmware ---------- 45
3.3.23Management Save/ Reload Settings---------- 46
3.3.24Management - Password Setup---------- 47
3.3.25Management – WatchDog Setup---------- 47
3.3.26Management - Qos Setup ---------- 48
3.3.27Logout---------- 49
4.FREQUENTLY ASKED QUESTIONS (FAQ) ---------- 50
4.1 WHAT AND HOW TO FIND MY PC'S IP AND MAC ADDRESS? ---------- 50
4.2 WHAT is WIRELESS LAN?---------- 50
4.3 WHAT ARE ISM BANDS?---------- 50
4.4 HOW DOES WIRELESS NETWORKING WORK?---------- 50
4.5 WHATISBSSID? ---------- 51
4.6 WHATISESSID? ---------- 51
4.7 WHAT ARE POTENTIAL FACTORS THAT MAY CAUSES INTERFERENCE? ---------- 51
4.8 WHAT ARE THE OPEN SYSTEMAND SHARED KEY AUTHENTICATIONS? ---------- 51
4.9 WHATISWEP? ---------- 51
4.10 WHAT is FRAGMENT THRESHOLD? ---------- 52
4.11 WHAT IS RTS (REQUEST TO SEND) THRESHOLD? ---------- 52
4.12 WHAT is BEACON INTERVAL? ---------- 52
4.13 WHAT is PREAMBLE TYPE?---------- 52
4.14 WHAT IS SSID BROADCAST?---------- 52
4.15 WHAT IS WI-FI PROTECTED ACCESS (WPA)? ---------- 53
4.16 WHATISWPA2? ---------- 53
4.17 WHAT is 802.1x AUTHENTICATION? ---------- 53
4.18 WHAT IS TEMPORAL KEY INTEGRITY PROTOCOL (TKIP)?---------- 53
4.19 WHAT IS ADVANCED ENCRYPTION STANDARD (AES)? ---------- 53
4.20 WHAT IS INTER-ACCESS POINT PROTOCOL (IAPP)?---------- 53
4.21 WHAT IS WIRELESS DISTRIBUTION SYSTEM (WDS)? ---------- 53
4.22 WHAT IS UNIVERSAL PLUG AND PLAY (UPNP)? ---------- 53
4.23 WHAT IS MAXIMUM TRANSMISSION UNIT (MTU) SIZE? ---------- 53
4.24 WHAT is CLONE MAC ADDRESS?---------- 54
4.25 WHATISDDNS? ---------- 54

4.26 WHAT IS NTP CLIENT? ---------- 54
4.27 WHAT is VPN? ---------- 54
4.28 WHATISIPSEC? ---------- 54

Terminology

3DES	Triple Data Encryption Standard
AES	Advanced Encryption Standard
ANSI	American National Standards Institute
AP	Access Point
CCK	Complementary Code Keying
CSMA/CA	Carrier Sense Multiple Access/Collision Avoidance
CSMA/CD	Carrier Sense Multiple Access/Collision Detection
DDNS	Dynamic Domain Name Server
DH	Diffie-Hellman Algorithm
DHCP	Dynamic Host Configuration Protocol
DSSS	Direct Sequence Spread Spectrum
EAP	Extensible Authentication Protocol
ESP	Encapsulating Security Payload
FCC	Federal Communications Commission
FTP	File Transfer Protocol
IEEE	Institute of Electrical and Electronic Engineers
IKE	Internet Key Exchange
IP	Internet Protocol
ISM	Industrial, Scientific and Medical
LAN	Local Area Network
MAC	Media Access Control
MD5	Message Digest 5
NAT	Network Address Translation
NT	Network Termination
NTP	Network Time Protocol
PPTP	Point to Point Tunneling Protocol
PSD	Power Spectral Density
RF	Radio Frequency
SHA1	Secure Hash Algorithm
SNR	Signal to Noise Ratio
SSID	Service Set Identification
TCP	Transmission Control Protocol
JTFTP	Trivial File Transfer Protocol
TKIP	Temporal Key Integrity Protocol
UPNP	Universal Plug and Play
VPN	Virtual Private Network
WDS	Wireless Distribution System
WEP	Wired Equivalent Privacy
WLAN	Wireless Local Area Network
WPA	Wi-Fi Protected Access

1 Introduction

The WLAN AP Router is IEEE 802.11b/g WLAN AP router solution; setting SOHO and enterprise standard for high performance, secure, manageable and reliable WLAN.

This document describes the steps required for the initial IP address assignment and other WLAN router configuration. The description includes the implementation of the above steps.

1.1 Package contents

The package of the WLAN AP Router includes the following items

- WLAN AP Router
- AC to DC power adapter
- Documentation CD
- Antenna
- RJ45 LAN cable

1.2 Product Specifications

Product Name	**WLAN AP Router**
Standard	802.11b/g(Wireless), 802.3(10BaseT), 802.3u(100BaseT)
Data Transfer Rate	54Mbps(Wireless), 1 OOMbps(Ethernet)
Modulation Method	CCK(802.1 lb), OFDM(802.1 lg)
Frequency Band	2.4GHz - 2.483GJz ISM Band, DSSS
RF Output Power	CCK< 17 dBm, OFDM< 13.5 dBm
Receiver Sensitivity	802.11b -80 dBm@10%, 802.llg -68 dBm@8%
Operation Range	30 to 280 meters (dependent on surroundings)
Antenna	External Antenna
LED	Power, Active (WLAN), Act/Link (Ethernet)
Security	64 bit/ 128 bit WEP, WPA, WPA2, port filtering, IP filtering,MAC filtering, port forwarding and DMZ hosting
LAN interface	One 10/1 OOBaseT with RJ45 connector (WAN) Four 10/1 OOBaseT with RJ45 connectors (LAN)
Power Consumption	12 V, 1A DC Power Adapter
Operating Temperature	0 ~ 50°C ambient temperature
Storage Temperature	-20 ~ 70°C ambient temperature
Humidity	5 to 90 % maximum (non-condensing)
Dimension	160 x 120 x 30 mm

1.3 Product Features

- Complies with IEEE 802.1 lb/g standard for 2.4GHz Wireless LAN.
- Supports bridging, routing, VPN, WISP functions between wireless and wired Ethernet interfaces.
- Supports 64-bit and 128-bit WEP, WPA, WPA2 encryption/decryption function to protect the wireless data transmission.
- Supports IEEE 802. lx Authentication.
- Support Wi-Fi Protected Access Authentication with Radius and Pre-Shared Key mode.
- Supports Inter-Access Point Protocol (IAPP).
- Supports Wireless Distribution System (WDS).
- Supports IEEE 802.3x full duplex flow control on 10/100M Ethernet interface.
- Supports DHCP server to provide clients auto IP addresses assignment.
- Supports DHCP client for Ethernet WAN interface auto IP address assignment.
- Supports static and dynamic IP routing.
- Supports PPPoE on Ethernet WAN interface.
- Supports clone MAC address function.
- Supports firewall security with port filtering, IP filtering, MAC filtering, port forwarding, trigger port and DMZ hosting functions.
- Supports WEB based management and configuration.
- Supports PPTP Client on Ethernet WAN interface.
- Supports UPnP for automatic Internet access.
- Supports Dynamic DNS service.
- Supports NTP client service.
- Supports Log table and remote Log service.
- Support Setup Wizard mode.
- Supports Virtual Private Network (VPN) connection.
- Supports IPSEC tunnel encryption(3DES/AES128) and authentication(MD5/SHAl)
- Supports WISP (Wireless ISP).

1.4 Front Panel Description

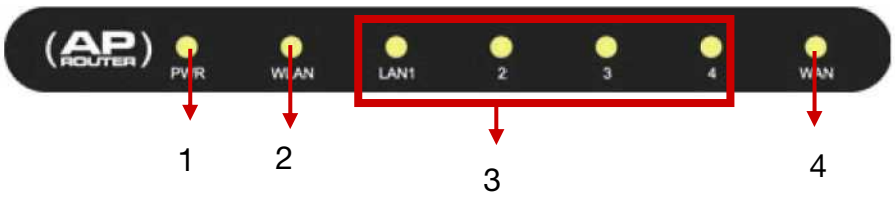


Figure 1 -WLAN AP Router Front Panel

LED Indicator	State	Description
1. POWER LED	On	The WLAN AP Router is powered on.
	Off	The WLAN AP Router is powered off.
2. WLAN LED	Flashing	Data is transmitting or receiving on the antenna.
	Off	No data is transmitting or receiving on the antenna.
3. LAN LED ACT (LAN 1-4)	On	Data is transmitting or receiving on the LAN interface.
	Off	No data is transmitting or receiving on the LAN interface.
4. WAN LED ACT	Flashing	Data is transmitting or receiving on the WAN interface.
	Off	No data is transmitting or receiving on the WAN interface.

1.5 Rear Panel Description

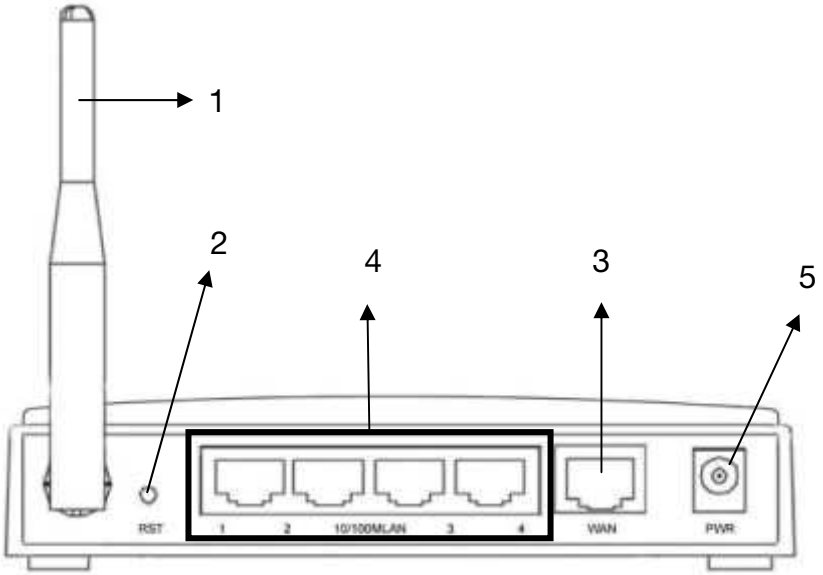


Figure 2 - WLAN AP Router Rear Panel (SMA Antenna)

Interfaces	Description
1.Antenna (SMA)	The Wireless LAN Antenna.(Figure 2)
2.Reset	Push continually the reset button 5 ~ 10 seconds to reset the configuration parameters to factory defaults.
3.WAN	The RJ-45 socket allows WAN connection through a Category 5 cable. Support auto-sensing on 10/100M speed and half/ full duplex; comply with IEEE 802.3/ 802.3u respectively.
4.LAN	The RJ-45 sockets allow LAN connection through Category 5 cables. Support auto-sensing on 10/100M speed and half/ full duplex; comply with IEEE 802.3/ 802.3u respectively.
5.Power	The power jack allows an external DC 12 V power supply connection. The external AC to DC adaptor provide adaptive power requirement to the WLAN AP Router.

2 Installation

2.1 Hardware Installation

Step 1: Place the WLAN AP Router to the optimum transmission location. The best transmission location for your WLAN AP Router is usually at the geographic center of your wireless network, with line of sign to all of your mobile stations.

Step 2: Prior to connecting the hardware, make sure to power off your Ethernet device, Cable/ADSL modem and Broadband Router. Then follow the steps below to connect the related devices.

◎**Connect your computer to the LAN port.**

Attach one end of the Ethernet cable with RJ-45 connector to your hub, switch or a computer's Ethernet port, and the other end to one of the LAN ports of your Broadband Router.

◎**Connect then Cable/ADSL Modem to the WAN port.**

Connect the Ethernet cable attaching to your Cable/ADSL modem to the WAN port of your Broadband Router.

Step 3: **Connect the power adapter.**

Connect the single DC output connector of the power adapter to the power jack on the side of the Broadband Router. Then plug the Power Adapter into an AC outlet.

Step 4: **Power on the following devices in this order:**

Cable/ADSL modem, Router, and PCs

The hardware installation is finished.

2.2 Software Installation

- There are no software drivers, patches or utilities installation needed, but only the configuration setting. Please refer to chapter 3 for software configuration.

Notice:

It will take about 1 minute to complete the boot up sequence after powered on the WLAN AP Router; Power LED will be active, and after that the WLAN Activity LED will be flashing to show the WLAN interface is enabled and working now.

3 Software configuration

The web based management and configuration functions allow you to do the step-by-step easily.

The WLAN AP Router is delivered with the following factory default parameters on the Ethernet LAN interfaces. **For the first time setting,** you need to use the computer which connects to the **LAN port** of the router to complete the first setting **Directly by RJ45 cable**.

Default IP Address: ***192.168.1.254***

Default IP subnet mask: ***255.255.255.0***

WEB login User Name: ***user***

WEB login Password: ***user***

3.1 Prepare your PC to configure the WLAN AP Router

For Microsoft Windows 95/ 98/ ME:

1. Click the **Start** button and select **Settings**, then click **Control Panel**. The **Control Panel** window will appear.

   Note: Windows Me users may not see the Network control panel. If so, select View all Control Panel options on the left side of the window
2. Move mouse and double-click the right button on **Network** icon. The **Network** window will appear.
3. **Check the installed list of Network Components.** If **TCP/IP is not installed**, click the **Add** button to install it; **otherwise go to step 6**.
4. Select **Protocol** in the Network Component Type dialog box and click **Add** button.
5. Select **TCP/IP** in Microsoft of Select **Network Protocol** dialog box then click **OK** button to install the TCP/IP protocol, it may need the **Microsoft Windows CD to complete the installation. Close and go back to Network dialog box after the TCP/IP installation.**
6. Select **TCP/IP** and click the **properties** button on the Network dialog box.
7. Select **Specify an IP address** and type in values as following example.

✓ IP Address: ***192.168.1.1***, IP address within the range of 192.168.1.1 to 192.168.1.253 is used to connect the WLAN AP Router.

✓ IP Subnet Mask: ***255.255.255.0***

8. Click **OK** and **reboot your PC** after completing the IP parameters setting.

For Microsoft Windows 2000/XP/Vista:

1. Click the **Start** button and select **Settings**, then click **Control Panel**. The **Control Panel** window will appear.

2. Move mouse and double-click the right button on **Network and Dial-up Connections** icon. Move mouse and double-click the **Local Area Connection** icon. The **Local Area Connection** window will appear. Click **Properties** button in the **Local Area Connection** window.

3. Check the installed list of **Network Components**. If TCP/IP is not installed, click the **Add** button to install it; otherwise go to step 6.

4. Select **Protocol** in the **Network Component Type** dialog box and click **Add** button.

5. Select **TCP/IP** in **Microsoft** of **Select Network Protocol** dialog box then click OK button to install the TCP/IP protocol, it may need the Microsoft Windows CD to complete the installation. Close and go back to **Network** dialog box after the TCP/IP installation.

6. Select **TCP/IP** and click the **properties** button on the **Network** dialog box.

7. Select **Specify an IP address** and type in values as following example.

   ✓ IP Address: **192.168.1.1**, IP address within the range of 192.168.1.1 to 192.168.1.253 is used to connect the WLAN AP Router.

   ✓ IP Subnet Mask: **255.255.255.0**

For Microsoft Windows NT:

1. Click the **Start** button and select Settings, then click **Control Panel**. The **Control Panel** window will appear.

2. Move mouse and double-click the right button on **Network** icon. The **Network** window will appear. Click **Protocol** tab from the **Network** window.

3. Check the installed list of **Network Protocol** window. If **TCP/IP is not installed, click the Add button to install it; otherwise go to step 6.**

4. Select **Protocol in the Network Component** Type dialog box and click **Add** button.

5. Select **TCP/IP** in Microsoft of Select **Network Protocol** dialog box then click **OK** button to install the TCP/IP protocol, it may need the **Microsoft Windows CD to complete the installation. Close and go back to Network** dialog box after the TCP/IP installation.

6. Select **TCP/IP** and click the **properties** button on the Network dialog box.

7. Select **Specify an IP address** and type in values as following example.

   ✓ IP Address: ***192.168.1.1***, IP address within the range of 192.168.1.1 to 192.168.1.253 is used to connect the WLAN AP Router.

   ✓ IP Subnet Mask: ***255.255.255.0***

8. Click **OK** to complete the IP parameters setting.

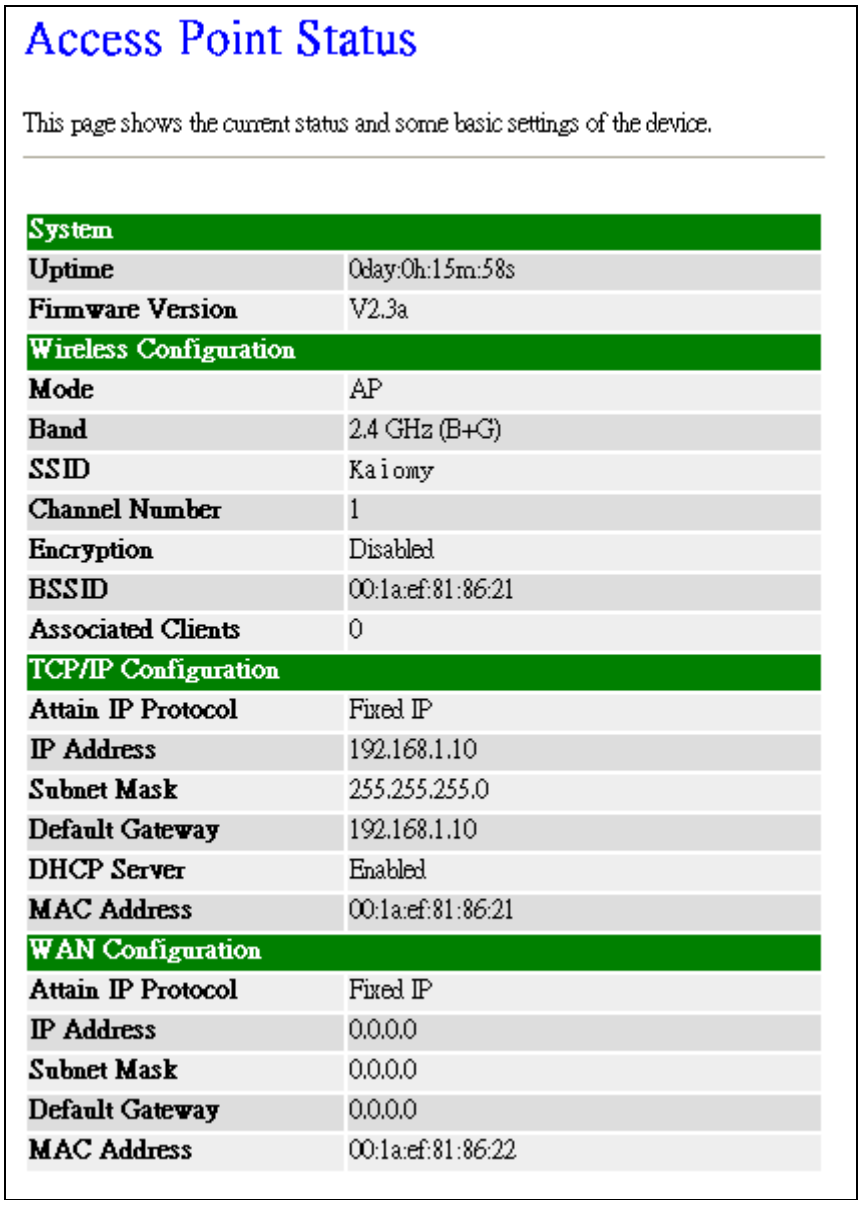
3.2 Connect to the WLAN AP Router

Open a **WEB browser**, i.e. Microsoft Internet Explorer, then enter **192.168.1.254** on the URL to connect the WLAN AP Router.

3.3 Management and configuration on the WLAN AP Router

3.3.1 Status

This page shows the current status and some basic settings of the device, includes system, wireless, Ethernet LAN and WAN configuration information.



Access Point Status

This page shows the current status and some basic settings of the device.

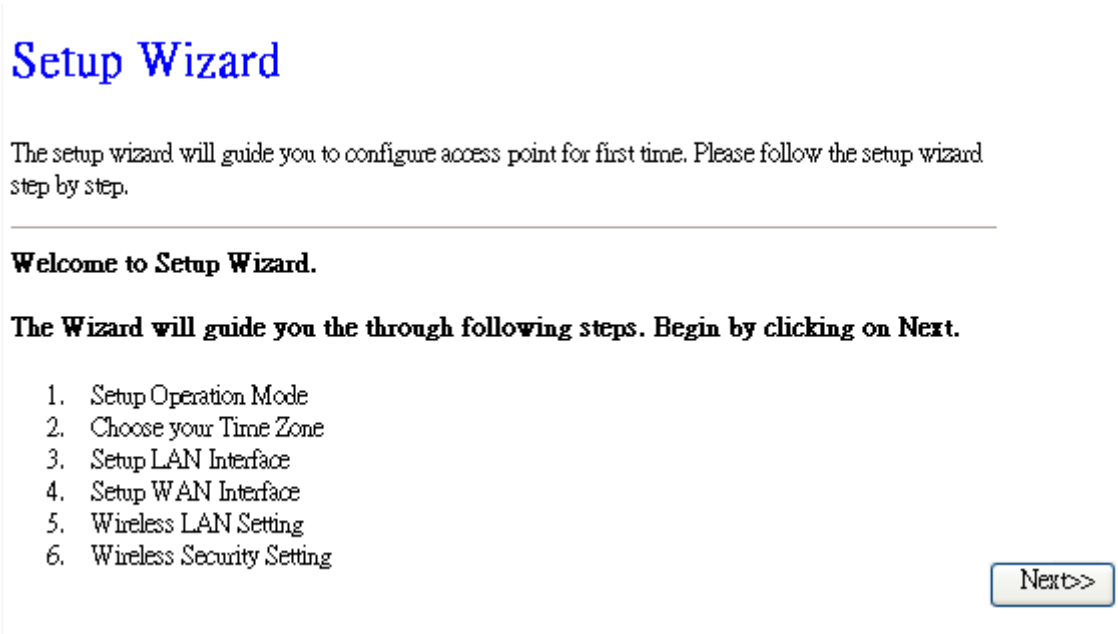
System	
Uptime	0day:0h:15m:58s
Firmware Version	V2.3a
Wireless Configuration	
Mode	AP
Band	2.4 GHz (B+G)
SSID	Kaiomy
Channel Number	1
Encryption	Disabled
BSSID	00:1a:ef:81:86:21
Associated Clients	0
TCP/IP Configuration	
Attain IP Protocol	Fixed IP
IP Address	192.168.1.10
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.10
DHCP Server	Enabled
MAC Address	00:1a:ef:81:86:21
WAN Configuration	
Attain IP Protocol	Fixed IP
IP Address	0.0.0.0
Subnet Mask	0.0.0.0
Default Gateway	0.0.0.0
MAC Address	00:1a:ef:81:86:22

Screen snapshot – Status

Item	Description
System	
Uptime	It shows the duration since WLAN AP Router is powered on.
Firmware version	It shows the firmware version of WLAN AP Router.
Wireless configuration	
Mode	It shows wireless operation mode
Band	It shows the current wireless operating frequency.
SSID	It shows the SSID of this WLAN AP Router. The SSID is the unique name of WLAN AP Router and shared among its service area, so all devicesattempts to join the same wireless network can identify it.
Channel Number	It shows the wireless channel connected currently.
Encryption	It shows the status of encryption function.
Associated Clients	It shows the number of connected clients (or stations,PCs).
BSSID	It shows the BSSID address of the WLAN AP Router.BSSID is a six-byte address.
LAN configuration	
IP Address	It shows the IP address of LAN interfaces of WLAN AP Router.
Subnet Mask	It shows the IP subnet mask of LAN interfaces of WLAN AP Router.
Default Gateway	It shows the default gateway setting for LAN interfaces outgoing data packets.
DHCP Server	It shows the DHCP server is enabled or not.
MAC Address	It shows the MAC address of LAN interfaces of WLAN AP Router.
WAN configuration	
Attain IP Protocol	It shows how the WLAN AP Router gets the IP address. The IP address can be set manually to a fixed one or set dynamically by DHCP server or attain IP by PPPoE / PPTP connection.
IP Address	It shows the IP address of WAN interface of WLAN AP Router.
Subnet Mask	It shows the IP subnet mask of WAN interface of WLAN AP Router.
Default Gateway	It shows the default gateway setting for WAN interface outgoing data packets.
MAC Address	It shows the MAC address of WAN interface of WLAN AP Router.

3.3.2 Setup Wizard

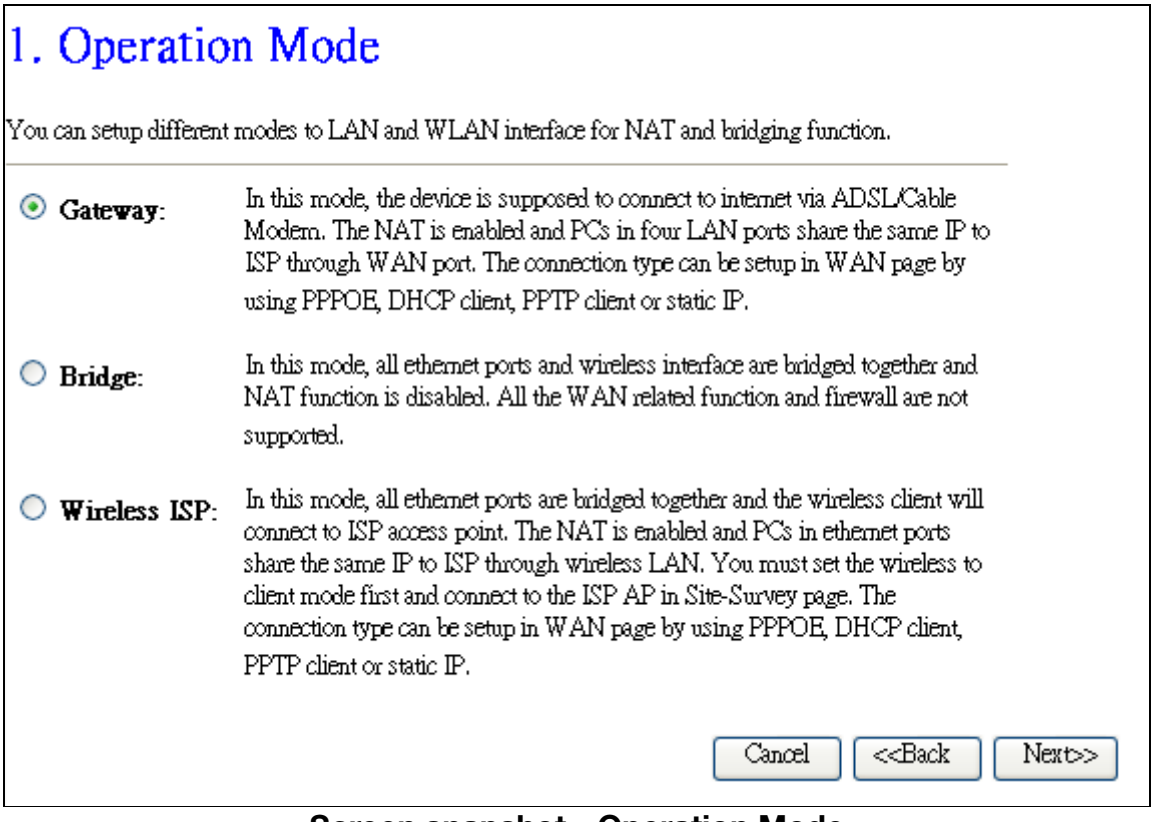
This page guides you to configure wireless AP router for first time


Setup Wizard
The setup wizard will guide you to configure access point for first time. Please follow the setup wizard step by step.
Welcome to Setup Wizard.
The Wizard will guide you the through following steps. Begin by clicking on Next.
1. Setup Operation Mode
2. Choose your Time Zone
3. Setup LAN Interface
4. Setup WAN Interface
5. Wireless LAN Setting
6. Wireless Security Setting
Next>>

Screen snapshot - Setup Wizard

I Operation Mode

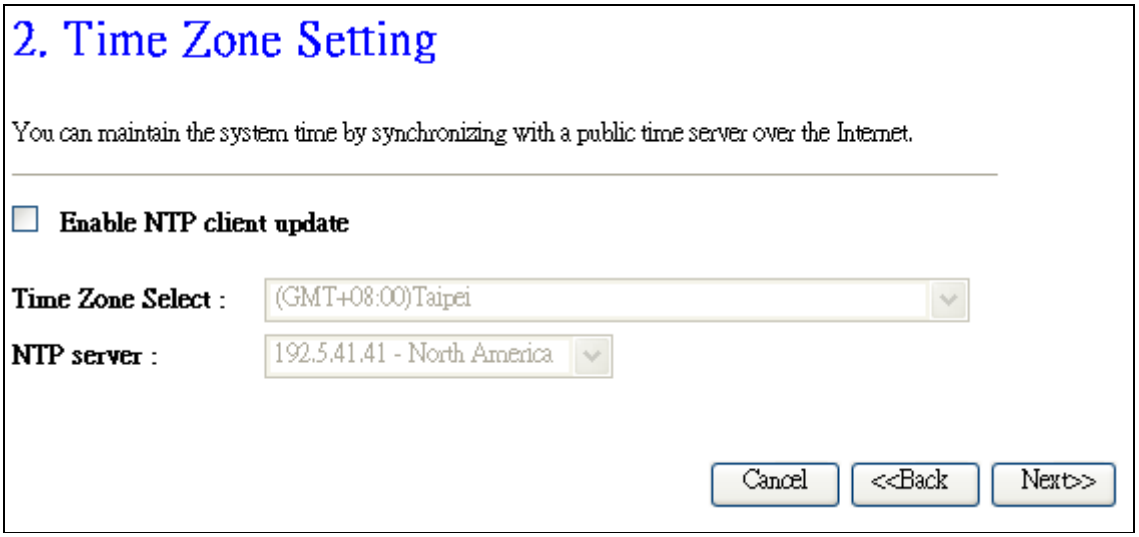
This page followed by Setup Wizard page to define the operation mode.


1. Operation Mode
You can setup different modes to LAN and WLAN interface for NAT and bridging function.
Gateway: In this mode, the device is supposed to connect to internet via ADSL/Cable Modem. The NAT is enabled and PCs in four LAN ports share the same IP to ISP through WAN port. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or static IP.
Bridge: In this mode, all ethernet ports and wireless interface are bridged together and NAT function is disabled. All the WAN related function and firewall are not supported.
Wireless ISP: In this mode, all ethernet ports are bridged together and the wireless client will connect to ISP access point. The NAT is enabled and PCs in ethernet ports share the same IP to ISP through wireless LAN. You must set the wireless to client mode first and connect to the ISP AP in Site-Survey page. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or static IP.
Cancel
<<Back
Next>>

Screen snapshot - Operation Mode

II Time Zone Setting

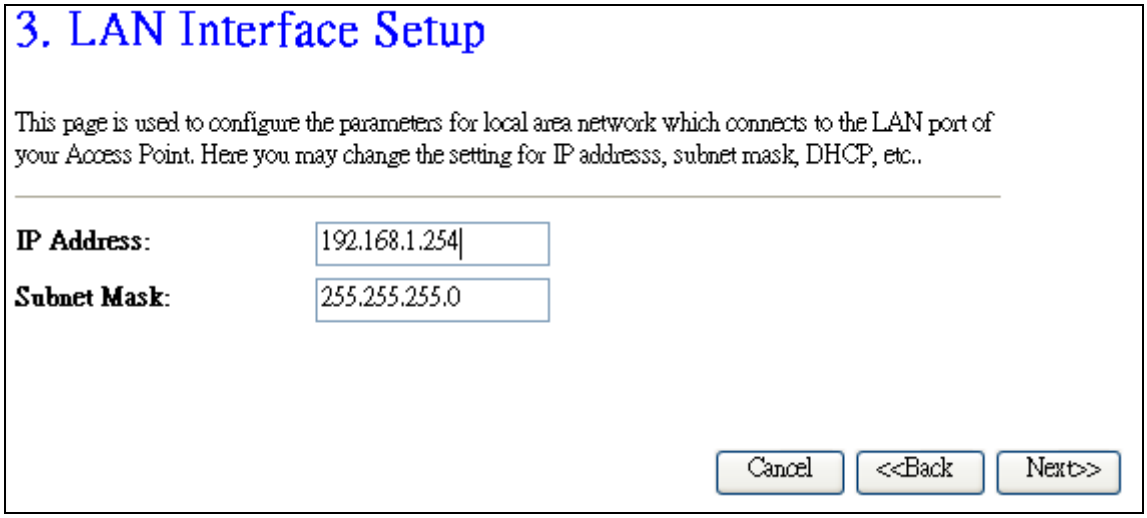
This page is used to enable and configure NTP client


2. Time Zone Setting
You can maintain the system time by synchronizing with a public time server over the Internet.
Enable NTP client update
Time Zone Select :
(GMT+08:00)Taipei
NTP server :
192.5.41.41 - North America
Cancel
<<Back
Next>>

Screen snapshot - Time Zone Settings

III LAN Interface Setup

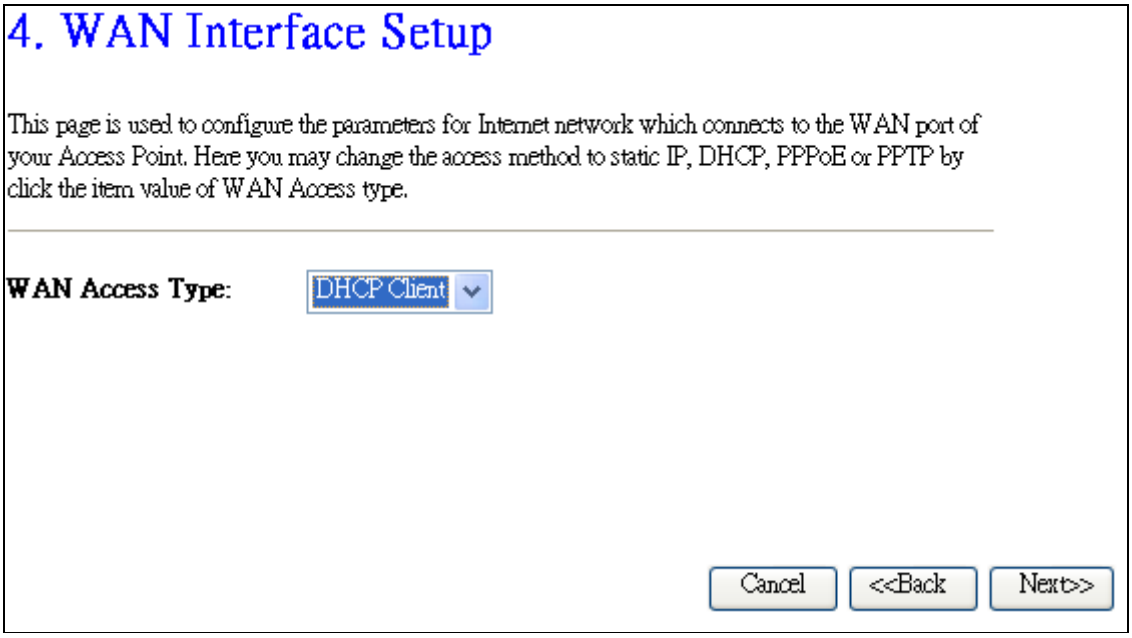
This page is used to enable and configure NTP client


3. LAN Interface Setup
This page is used to configure the parameters for local area network which connects to the LAN port of your Access Point. Here you may change the setting for IP addresss, subnet mask, DHCP, etc..
IP Address:
192.168.1.254
Subnet Mask:
255.255.255.0
Cancel
<<Back
Next>>

Screen snapshot - LAN Interface Setup

IV WAN Interface Setup

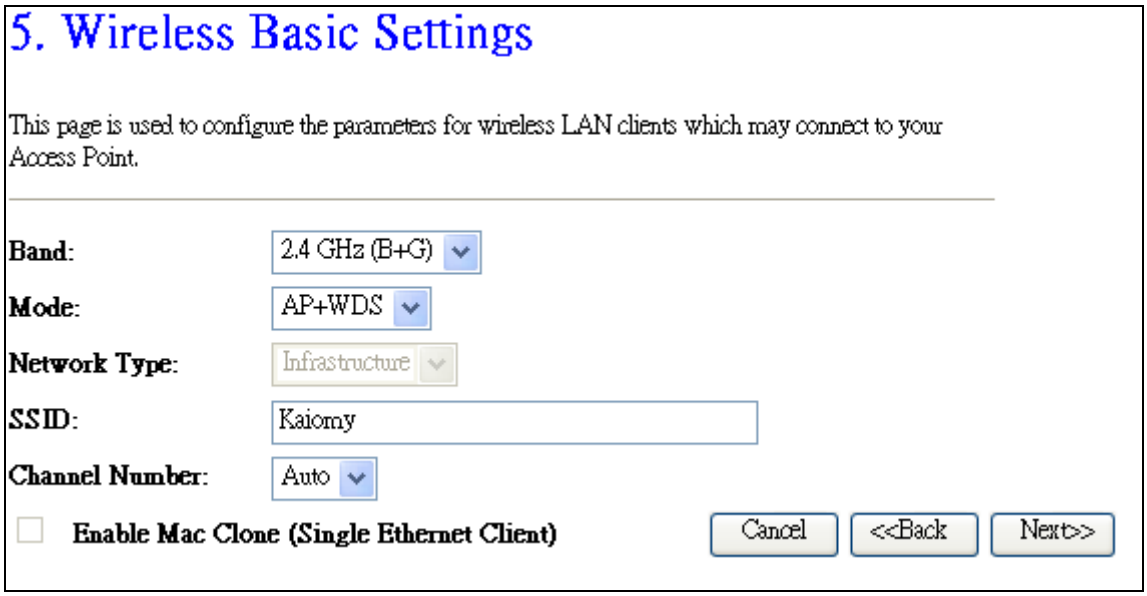
This page is used to configure WAN access type


4. WAN Interface Setup
This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE or PPTP by click the item value of WAN Access type.
WAN Access Type:
DHCP Client
Cancel
<<Back
Next>>

Screen snapshot - WAN Interface Setup

V Wireless Basic Settings

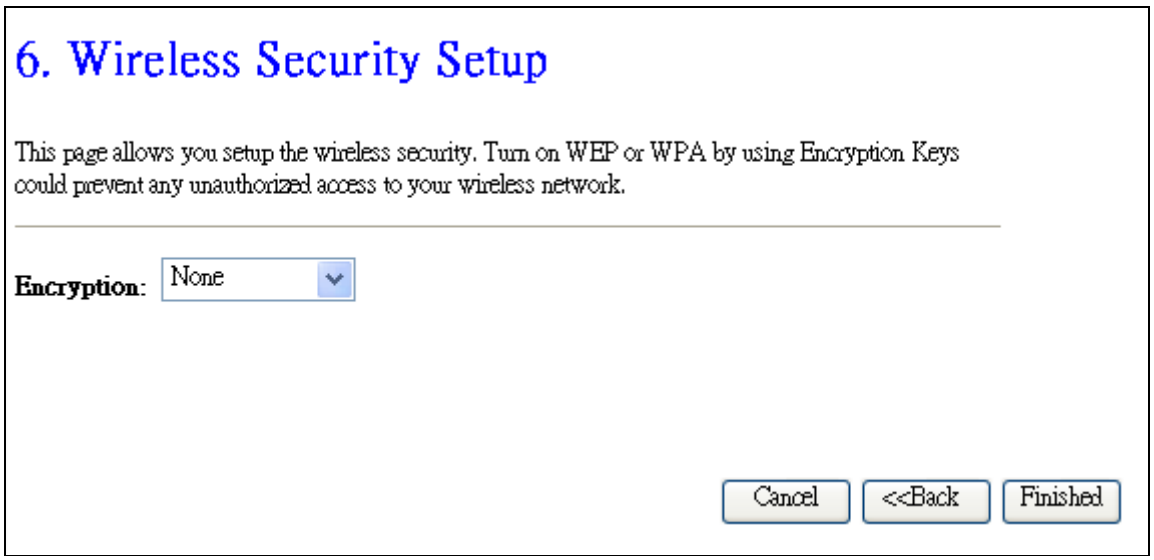
This page is used to configure basic wireless parameters like Band, Mode, Network Type SSID, Channel Number, Enable Mac Clone(Single Ethernet Client)



Screen snapshot — Wireless Basic Settings

VI Wireless Security Setup

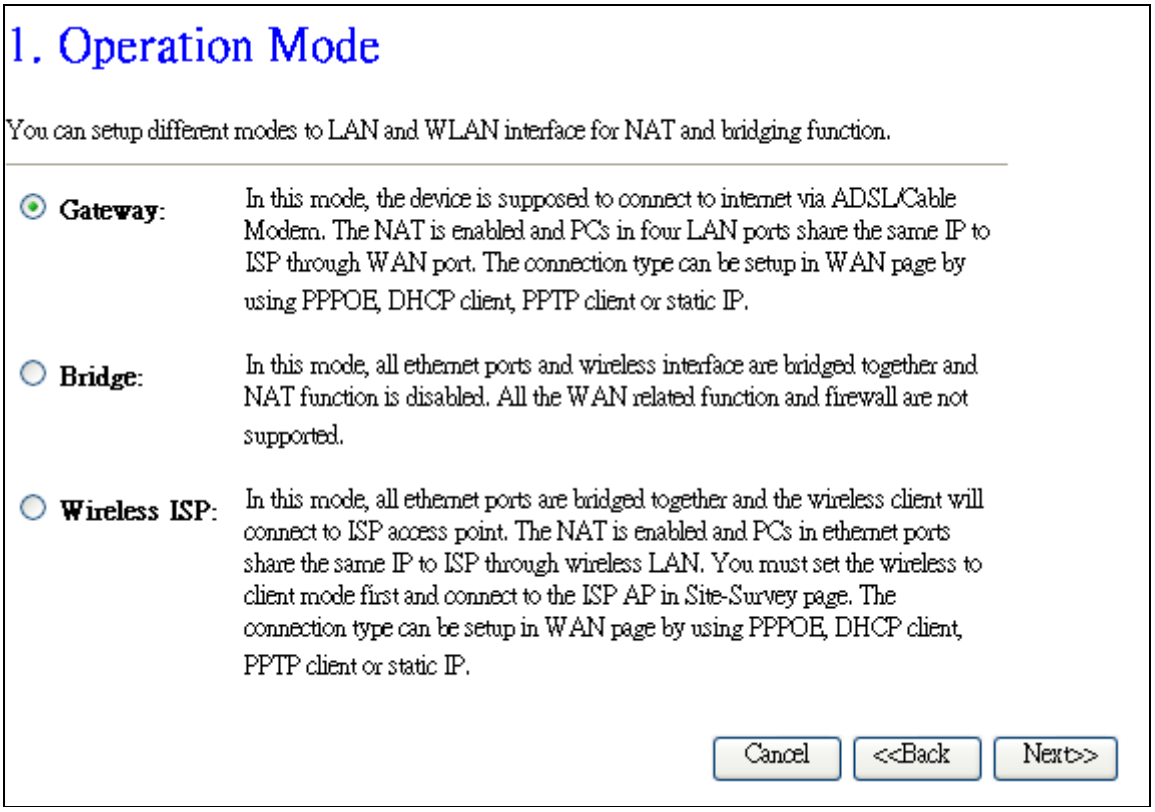
This page is used to configure wireless security


6. Wireless Security Setup
This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption Keys could prevent any unauthorized access to your wireless network.
Encryption: None
Cancel
<<Back
Finished

Screen snapshot - Wireless Security Setup

3.3.3 Operation Mode

This page is used to configure which mode wireless AP router acts

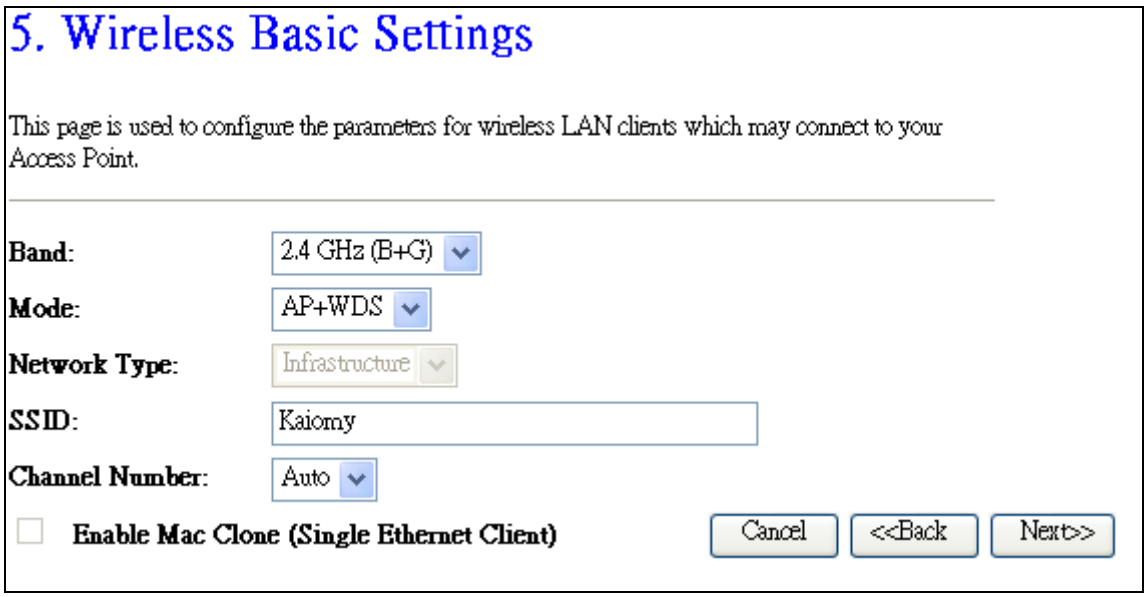

1. Operation Mode
You can setup different modes to LAN and WLAN interface for NAT and bridging function.
Gateway: In this mode, the device is supposed to connect to internet via ADSL/Cable Modem. The NAT is enabled and PCs in four LAN ports share the same IP to ISP through WAN port. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or static IP.
Bridge: In this mode, all ethernet ports and wireless interface are bridged together and NAT function is disabled. All the WAN related function and firewall are not supported.
Wireless ISP: In this mode, all ethernet ports are bridged together and the wireless client will connect to ISP access point. The NAT is enabled and PCs in ethernet ports share the same IP to ISP through wireless LAN. You must set the wireless to client mode first and connect to the ISP AP in Site-Survey page. The connection type can be setup in WAN page by using PPPOE, DHCP client, PPTP client or static IP.
Cancel
<<Back
Next>>

Screen snapshot - Operation Mode

Item	Description
Gateway	Traditional gateway configuration. It always connects internet via ADSL/Cable Modem. LAN interface, WAN interface, Wireless interface, NAT and Firewall modules are applied to this mode
Bridge	Each interface (LAN, WAN and Wireless) regards as bridge. NAT, Firewall and all router's functions are not supported
Wireless ISP	Switch Wireless interface to WAN port and all Ethernet ports in bridge mode. Wireless interface can do all router's functions
Apply Changes	Click the Apply Changes button to complete the new configuration setting.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.4 Wireless - Basic Settings

This page is used to configure the parameters for wireless LAN clients that may connect to your AP Router. Here you may change wireless encryption settings as well as wireless network parameters.

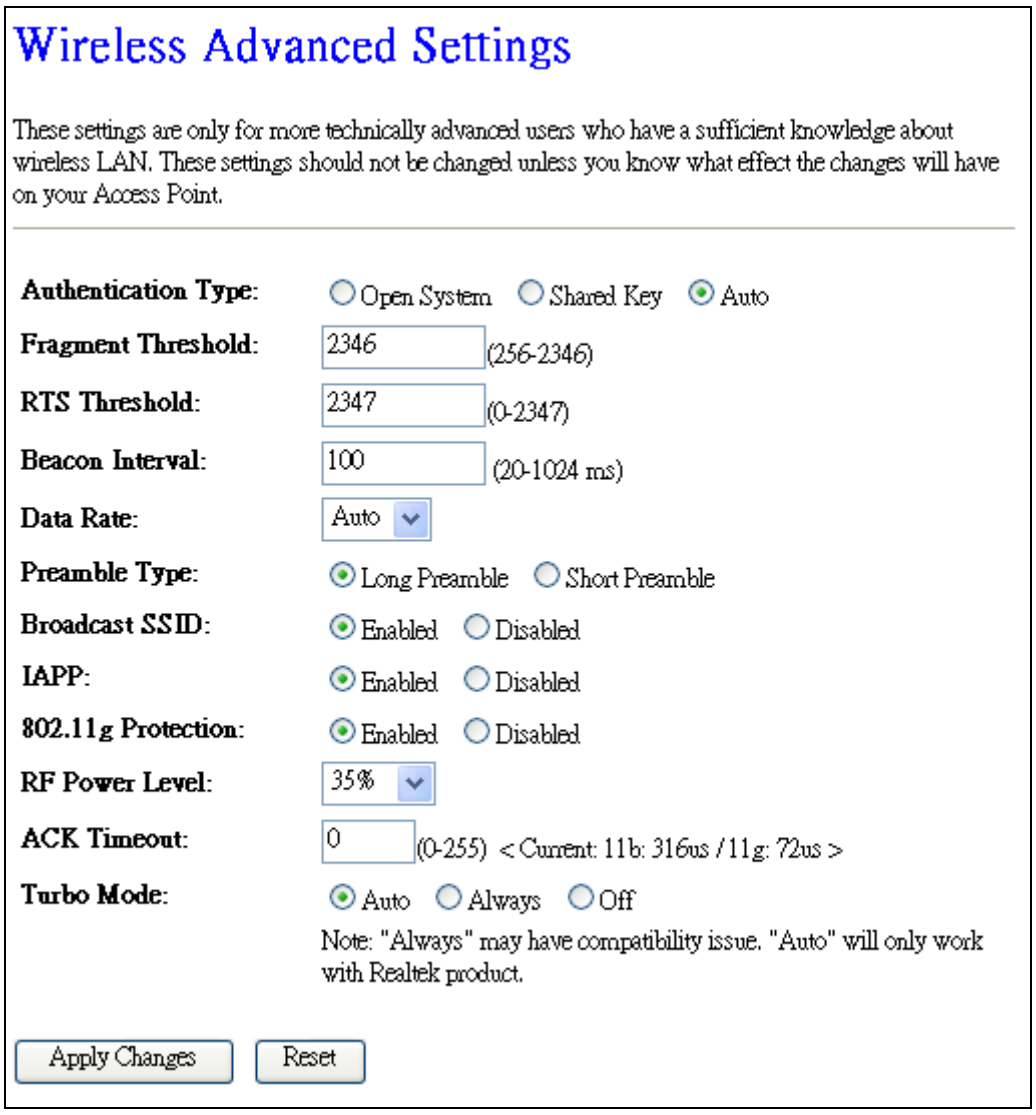


Screen snapshot. — Wireless Basic Settings

Item	Description
Disable Wireless LAN Interface	Click on to disable the wireless LAN data transmission.
Band	Click to select 2.4GHz(B) / 2.4GHz(G) / 2.4GHz(B+G)
Mode	Click to select the WLAN AP / Client / WDS / AP+WDS wireless mode.
Site Survey	The Site Survey button provides tool to scan the wireless network. If any Access Point or IBSS is found, you could choose to connect it manually when client mode is enabled. Refer to 3.3.9 Site Survey.
SSID	It is the wireless network name. The SSID can be 32 bytes long.
Channel Number	Select the wireless communication channel from pull-down menu
Associated Clients	Click the Show Active Clients button to open Active Wireless Client Table that shows the MAC address, transmit-packet, receive-packet and transmission-rate for each associated wireless client.
Enable Mac Clone (Single Ethernet Client)	Take Laptop NIC MAC address as wireless client MAC address. [Client Mode only]
Apply Changes	Click the Apply Changes button to complete the new configuration setting.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.5 Wireless - Advanced Settings

These settings are only for more technically advanced users who have a sufficient knowledge about wireless LAN. These settings should not be changed unless you know what effect the changes will have on your WLAN AP Router.


Wireless Advanced Settings
These settings are only for more technically advanced users who have a sufficient knowledge about wireless LAN. These settings should not be changed unless you know what effect the changes will have on your Access Point.
Authentication Type: Open System Shared Key Auto
Fragment Threshold: 2346 (256-2346)
RTS Threshold: 2347 (0-2347)
Beacon Interval: 100 (20-1024 ms)
Data Rate: Auto
Preamble Type: Long Preamble Short Preamble
Broadcast SSID: Enabled Disabled
IAPP: Enabled Disabled
802.11g Protection: Enabled Disabled
RF Power Level: 35%
ACK Timeout: 0 (0-255) < Current: 11b: 316us / 11g: 72us >
Turbo Mode: Auto Always Off
Note: "Always" may have compatibility issue. "Auto" will only work with Realtek product.
Apply Changes
Reset

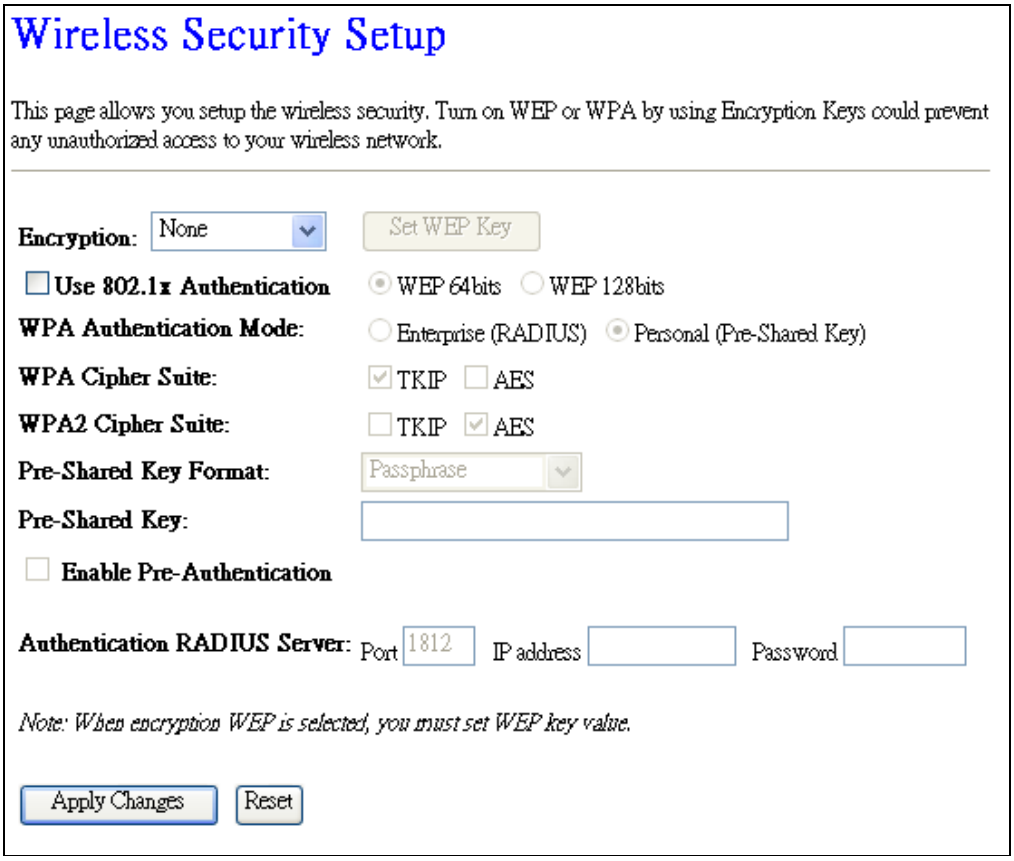
Screen snapshot - Wireless Advanced Settings

Item	Description
Authentication Type	Click to select the authentication type in Open System, Shared Key or Auto selection.
Fragment Threshold	Set the data packet fragmentation threshold, value can be written between 256 and 2346 bytes. Refer to 4.10 What is Fragment Threshold? Refer to 4.10 What is Fragment Threshold?
RTS Threshold	Set the RTS Threshold, value can be written between 0 and 2347 bytes. Refer to 4.11 What is RTS(Request To Send) Threshold?
Beacon Interval	Set the Beacon Interval, value can be written between 20 and 1024 ms. Refer to 4.12 What is Beacon Interval?
Data Rate	Select the transmission data rate from pull-down menu. Data rate can be auto-select, 11M, 5.5M, 2M or IMbps.
Preamble Type	Click to select the Long Preamble or Short Preamble support on the wireless data packet transmission. Refer to 4.13 What is Preamble Tvoe?
Broadcast SSID	Click to enable or disable the SSID broadcast function. Refer to 4.14 What is SSID Broadcast?

IAPP	Click to enable or disable the IAPP function. Refer to 4.20 What is Inter-Access Point Protocol(IAPP)?
802.1 lg Protection	Protect 802.1 lb user.
RF Power Level	Select the TX Power from 18-19dBm to 24-26dbm.
ACK Timeout	The Acknowledgement Timeout means from remote to local data transmission, one parameter to control both acknowledging action toguaranty those packets have already be received. Usually, for short distance, keep default setting is proposed. If there is long distance application, have minor increased with this parameter will be proposed.
Apply Changes	Click the Apply Changes button to complete the new configuration setting.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.6 Wireless - Security Setup

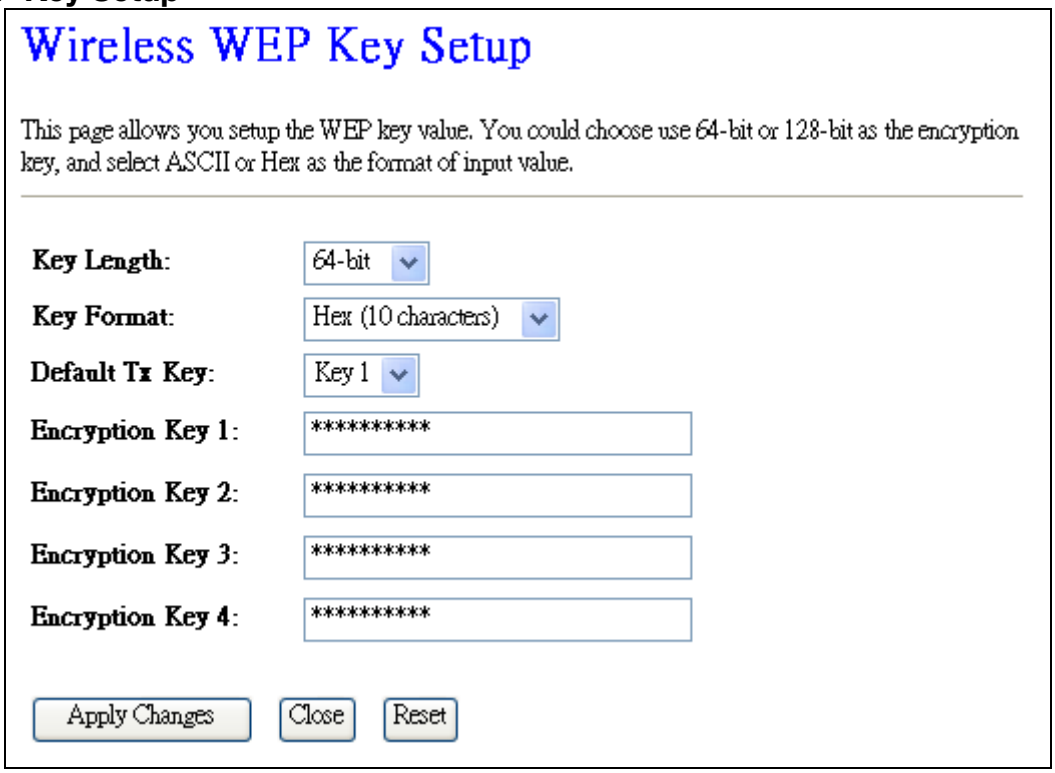
This page allows you setup the wireless security. Turn on WEP, WPA, WPA2 by using encryption keys could prevent any unauthorized access to your wireless network.



Screen snapshot - Wireless Security Setup

Item	Description
Encryption	Select the encryption supported over wireless access. The encryption method can be None, WEP, WPA(TKIP), WPA2 or WPA2 Mixed Refer to 4.9 What is WEP? 4.15 What is Wi-Fi Protected Access (WPA)? 4.16 What is WPA2CAES1? 4.17 What is 802. IX Authentication? 4.18 What is Temporal Kev Integrity Protocol (TKIP)? 4.19 What is Advanced Encryption Standard (AES)?
Use 802. lx	While Encryption is selected to be WEP.
Authentication	Click the check box to enable IEEE 802. lx authentication function. Refer to 4.16 What is 802.1 x Authentication?
WPA Authentication Mode	While Encryption is selected to be WPA. Click to select the WPA Authentication Mode with Enterprise (RADIUS) or Personal (Pre-Shared Key). Refer to 4.15 What is Wi-Fi Protected Access (WPA)?
Pre-Shared Key Format	While Encryption is selected to be WPA. Select the Pre-shared key format from the pull-down menu. The format can be Passphrase or Hex (64 characters). [WPA, Personal(Pre-Shared Key) only]
Pre-Shared Key	Fill in the key value. [WPA, Personal(Pre-Shared Key) only]
Enable Pre-Authentication	Click to enable Pre-Authentication. [WPA2/WPA2Mixed only, Enterprise only]
Authentication RADIUS Server	Set the IP address, port and login password information of authentication RADIUS sever.
Apply Changes	Click the Apply Changes button to complete the new configuration setting.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

I WEP Key Setup



Screen snapshot - WEP Key Setup

Item	Description
Key Length	Select the WEP shared secret key length from pull-downmenu. The length can be chose between 64-bit and 128-bit (known as "WEP2") keys. The WEP key is composed of initialization vector (24 bits) and secret key (40-bit or 104-bit).
Key Format	Select the WEP shared secret key format from pull-down menu. The format can be chose between plant text (ASCII) and hexadecimal (HEX) code.
Default Tx Key	Set the default secret key for WEP security function. Value can be chose between 1 and 4.
Encryption Key 1	Secret key 1 of WEP security encryption function.
Encryption Key 2	Secret key 2 of WEP security encryption function.
Encryption Key 3	Secret key 3 of WEP security encryption function.
Encryption Key 4	Secret key 4 of WEP security encryption function.
Apply Changes	Click the Apply Changes button to complete the new configuration setting.
Close	Click to close this WEP Key setup window.
Reset	Click the Reset button to abort change and recover the

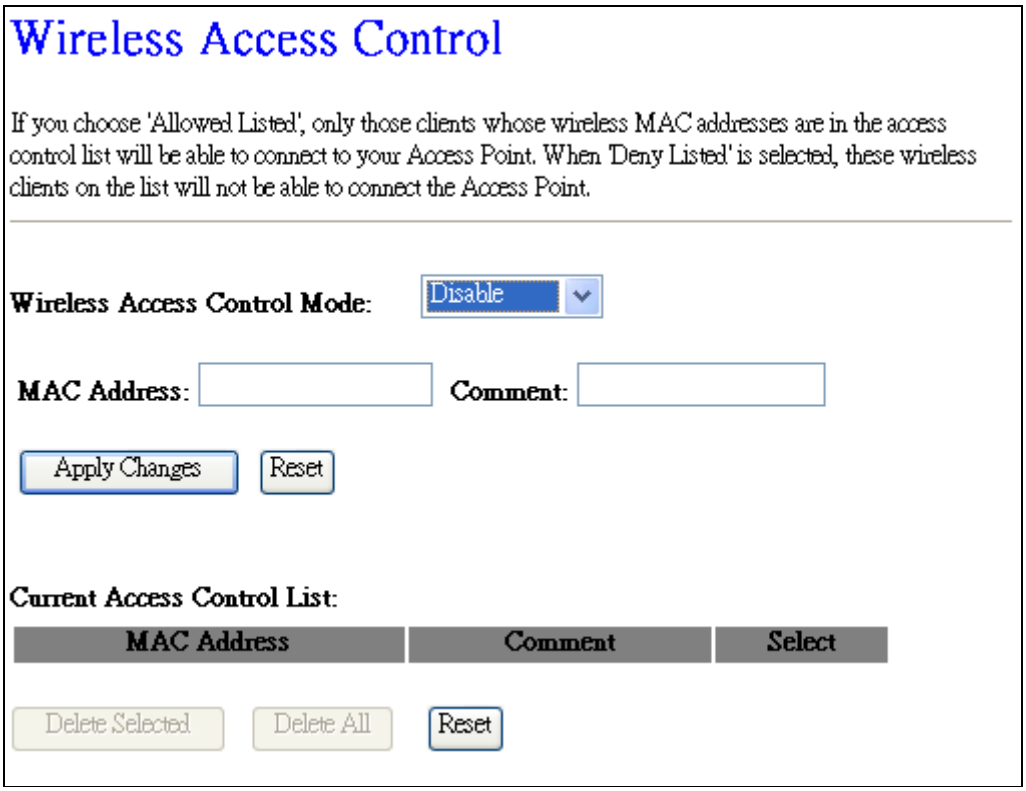
previous configuration setting.

WEP encryption key (secret key) length:

Format \ Length	64-bit	128-bit
ASCII	5 characters	13 characters
HEX	10 hexadecimal codes	26 hexadecimal codes

3.3.7 Wireless - Access Control

If you enable wireless access control, only those clients whose wireless MAC addresses are in the access control list will be able to connect to your Access Point. When this option is enabled, no wireless clients will be able to connect if the list contains no entries.


Wireless Access Control
If you choose 'Allowed Listed', only those clients whose wireless MAC addresses are in the access control list will be able to connect to your Access Point. When 'Deny Listed' is selected, these wireless clients on the list will not be able to connect the Access Point.
Wireless Access Control Mode:
Disable
MAC Address:
Comment:
Apply Changes
Reset
Current Access Control List:
MAC Address
Comment
Select
Delete Selected
Delete All
Reset

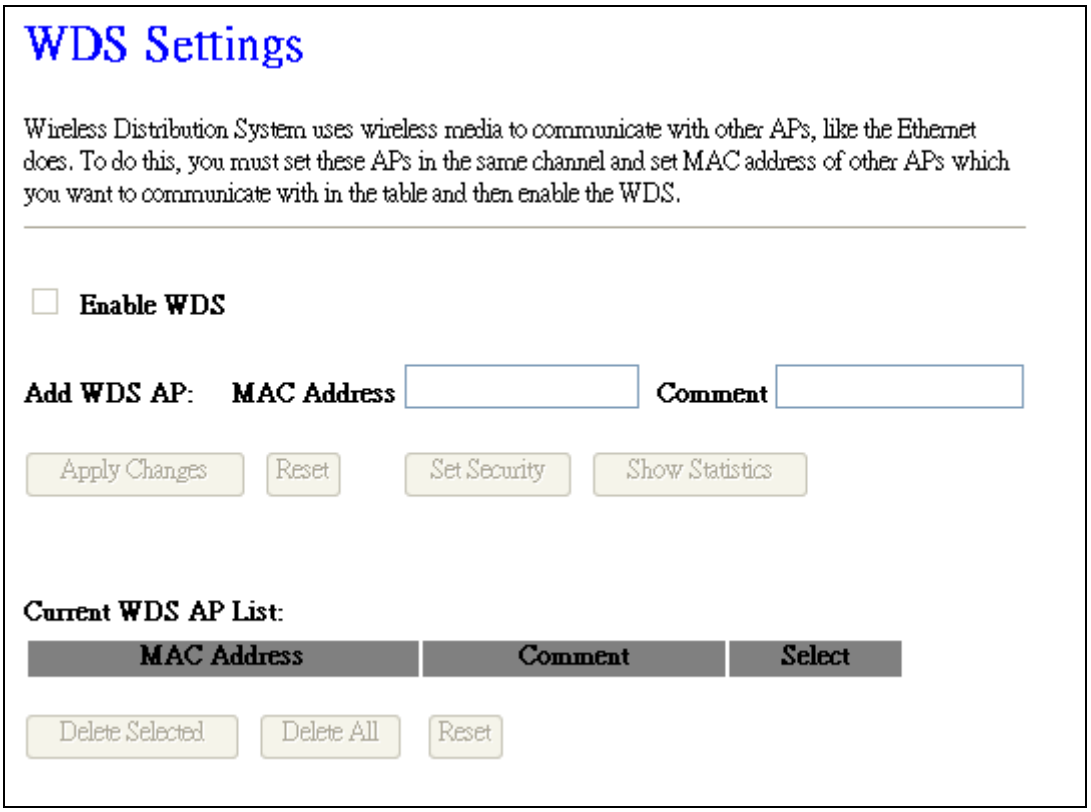
Screen snapshot - Wireless Access Control

Item	Description
Wireless Access Control Mode	Click the Disabled, Allow Listed or Deny Listed of drop down menu choose wireless access control mode. This is a security control function; only those clients registered in the access control list can link to this WLANAP Router.
MAC Address	Fill in the MAC address of client to register this WLAN AP Router access capability.
Comment	Fill in the comment tag for the registered client.
Apply Changes	Click the Apply Changes button to register the client to new configuration setting.

Reset	Click the Reset button to abort change and recover the previous configuration setting.
Current Access Control List	It shows the registered clients that are allowed to link to this WLAN AP Router.
Delete Selected	Click to delete the selected clients that will be access right removed from this WLAN AP Router.
Delete All	Click to delete all the registered clients from the access allowed list.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.8 WDS Settings

Wireless Distribution System uses wireless media to communicate with other APs, like the Ethernet does. To do this, you must set these APs in the same channel and set MAC address of other AP that you want to communicate with in the table and then enable the WDS.


WDS Settings
Wireless Distribution System uses wireless media to communicate with other APs, like the Ethernet does. To do this, you must set these APs in the same channel and set MAC address of other APs which you want to communicate with in the table and then enable the WDS.
Enable WDS
Add WDS AP: MAC Address
Comment
Apply Changes
Reset
Set Security
Show Statistics
Current WDS AP List:
MAC Address
Comment
Select
Delete Selected
Delete All
Reset

Screen snapshot - WDS Setup

Item	Description
Enable WDS	Click the check box to enable wireless distribution system. Refer to 4.21 What is Wireless Distribution Svstem (WDS)?
MAC Address	Fill in the MAC address of AP to register the wireless distribution system access capability.
Comment	Fill in the comment tag for the registered AP.
Apply Changes	Click the Apply Changes button to register the AP to new configuration setting.
Reset	Click the Reset button to abort change and recover the previous configuration setting.
Set Security	Click button to configure wireless security like WEP(64bits), WEP(128bits), WPA(TKIP), WPA2(AES) or None
Show Statistics	It shows the TX, RX packets, rate statistics
Delete Selected	Click to delete the selected clients that will be removed from the wireless distribution system.
Delete All	Click to delete all the registered APs from the wireless distribution system allowed list.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

I WDS Security Setup

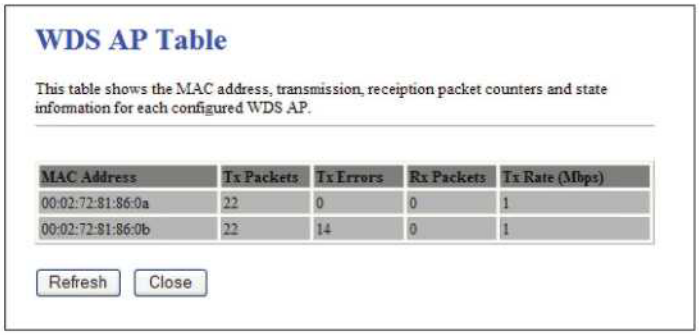
Requirement: Set [Wireless]->[Basic Settings]->[Mode]->AP+WDS

This page is used to configure the wireless security between APs. Refer to 3.3.6 Wireless Security Setup.

Screen snapshot - WPS Security Setup

II WDS AP Table

This page is used to show WDS statistics

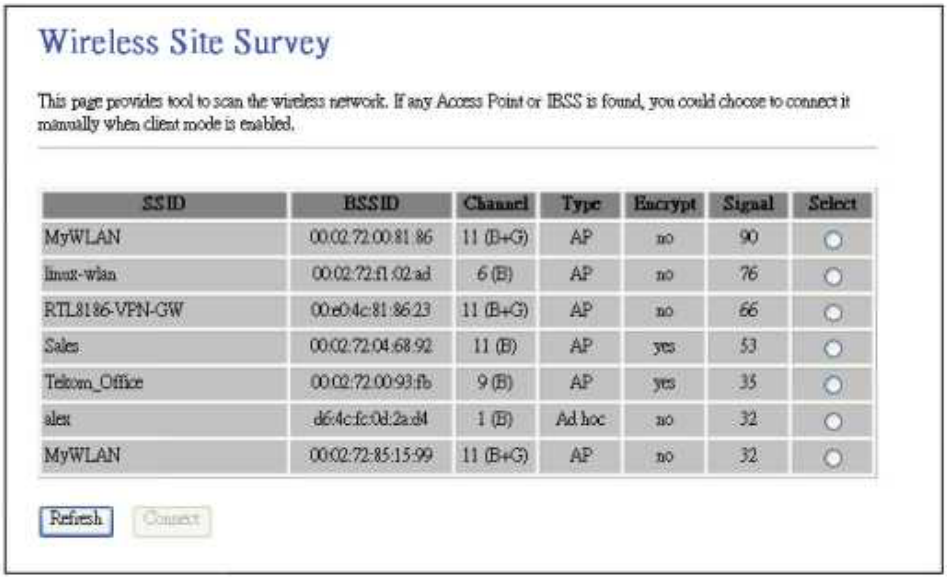

WDS AP Table
This table shows the MAC address, transmission, receiption packet counters and state information for each configured WDS AP.
MAC Address Tx Packets Tx Errors Rx Packets Tx Rate (Mbps)
00:02:72:81:86:0a 22 0 0 1
00:02:72:81:86:0b 22 14 0 1
Refresh
Close

Screen snapshot - WDS AP Table

Item	Description
MAC Address	It shows the MAC Address within WDS.
Tx Packets	It shows the statistic count of sent packets on the wireless LAN interface.
Tx Errors	It shows the statistic count of error sent packets on the Wireless LAN interface.
Rx Packets	It shows the statistic count of received packets on the wireless LAN interface.
Tx Rare (Mbps)	It shows the wireless link rate within WDS.
Refresh	Click to refresh the statistic counters on the screen.
Close	Click to close the current window.

3.3.9 Site Survey

This page is used to view or configure other APs near yours.

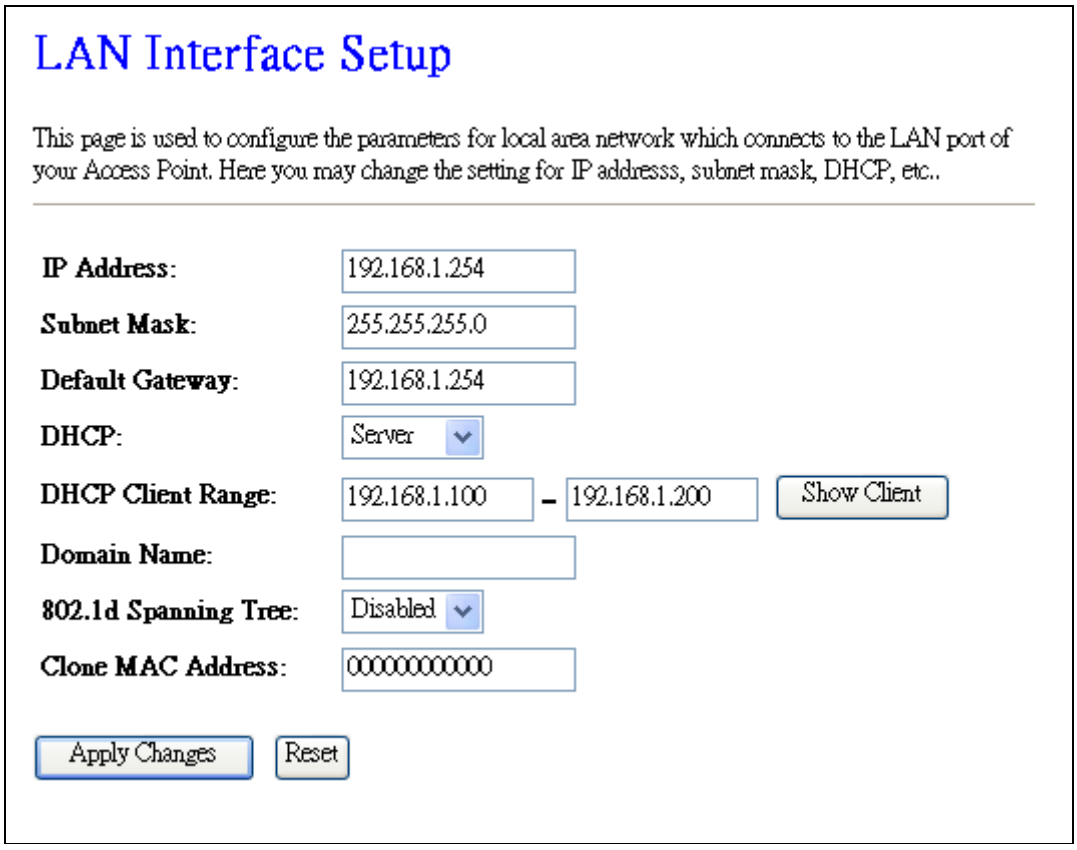

Wireless Site Survey
This page provides tool to scan the wireless network. If any Access Point or IBSS is found, you could choose to connect it manually when client mode is enabled.
SSID BSSID Channel Type Encrypt Signal Select
MyWLAN 00:02:72:00:81:86 11 (B+G) AP no 90
linux-wlan 00:02:72:f1:02:ad 6 (B) AP no 76
RTL8186-VPN-GW 00:e0:4c:81:86:23 11 (B+G) AP no 66
Sales 00:02:72:04:68:92 11 (B) AP yes 53
Telcom_Office 00:02:72:00:93:fb 9 (B) AP yes 35
alex d6:4c:fc:0d:2a:d4 1 (B) Ad hoc no 32
MyWLAN 00:02:72:85:15:99 11 (B+G) AP no 32
Refresh
Connect

Screen snapshot - Wireless Site Survey

Item	Description
SSID	It shows the SSID of AP.
BSSID	It shows BSSID of AP.
Channel	It show the current channel of AP occupied.
Type	It show which type AP acts.
Encrypt	It shows the encryption status.
Signal	It shows the power level of current AP.
Select	Click to select AP or client you'd like to connect.
Refresh	Click the Refresh button to re-scan site survey on the screen
Connect	Click the Connect button to establish connection.

3.3.10 LAN Interface Setup

This page is used to configure the parameters for local area network that connects to the LAN ports of your WLAN AP Router. Here you may change the setting for IP address, subnet mask, DHCP, etc.



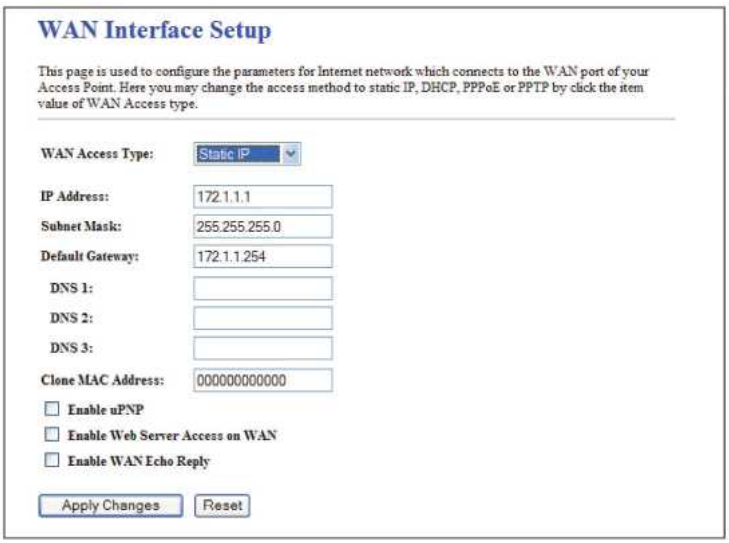
Screen snapshot - LAN Interface Setup

Item	Description
IP Address	Fill in the IP address of LAN interfaces of this WLAN AP Router.
Subnet Mask	Fill in the subnet mask of LAN interfaces of this WLAN AI Router.
Default Gateway	Fill in the default gateway for LAN interfaces out going data packets.
DHCP Server	Click to select Disabled, Client or Server in different operation mode of wireless AP router.
DHCP Client Range	Fill in the start IP address and end IP address to allocate a range of IP addresses; client with DHCP function set will be assigned an IP address from the range.
Show Client	Click to open the Active DHCP Client Table window that shows the active clients with their assigned IP address, MAC address and time expired information. [Server mode only]
802.Id Spanning Tree	Select to enable or disable the IEEE 802.Id Spanning Tree function from pull-down menu.
Clone MAC Address	Fill in the MAC address that is the MAC address to be cloned. Refer to 4.24 What is Clone MAC Address?
Apply Changes	Click the Apply Changes button to complete the new configuration setting.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.11 WAN Interface Setup

This page is used to configure the parameters for wide area network that connects to the WAN port of your WLAN AP Router. Here you may change the access method to Static IP, DHCP, PPPoE or PPTP by click the item value of WAN Access Type.

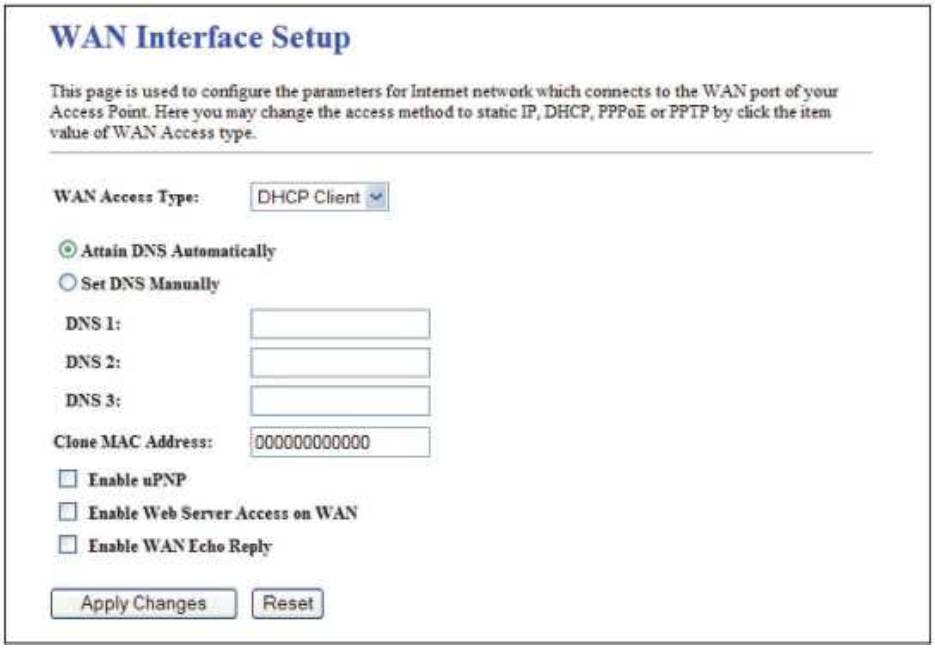
I Static IP


WAN Interface Setup
This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE or PPTP by click the item value of WAN Access type.
WAN Access Type:
Static IP
IP Address:
172.1.1.1
Subnet Mask:
255.255.255.0
Default Gateway:
172.1.1.254
DNS 1:
DNS 2:
DNS 3:
Clone MAC Address:
000000000000
Enable uPNP
Enable Web Server Access on WAN
Enable WAN Echo Reply
Apply Changes
Reset

Screen snapshot - WAN Interface Setup - Static IP

Item	Description
Static IP	Click to select Static IP support on WAN interface. There are IP address, subnet mask and default gateway settings need to be done.
IP Address	If you select the Static IP support on WAN interface, fill in the IP address for it.
Subnet Mask	If you select the Static IP support on WAN interface, fill in the subnet mask for it.
Default Gateway	If you select the Static IP support on WAN interface, fill in the default gateway for WAN interface out going data packets.
DNS 1	Fill in the IP address of Domain Name Server 1.
DNS 2	Fill in the IP address of Domain Name Server 2.
DNS 3	Fill in the IP address of Domain Name Server 3.
Clone MAC Address	Fill in the MAC address that is the MAC address to be cloned. Refer to 4.24 What is Clone MAC Address?
Enable uPNP	Click the checkbox to enable uPNP function. Refer to 4.22 What is Universal Plus and Plav (uPNP)?
Enable Web Server Access on WAN	Click the checkbox to enable web configuration from WAN side.
Apply Changes	Click the Apply Changes button to complete the new configuration setting.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

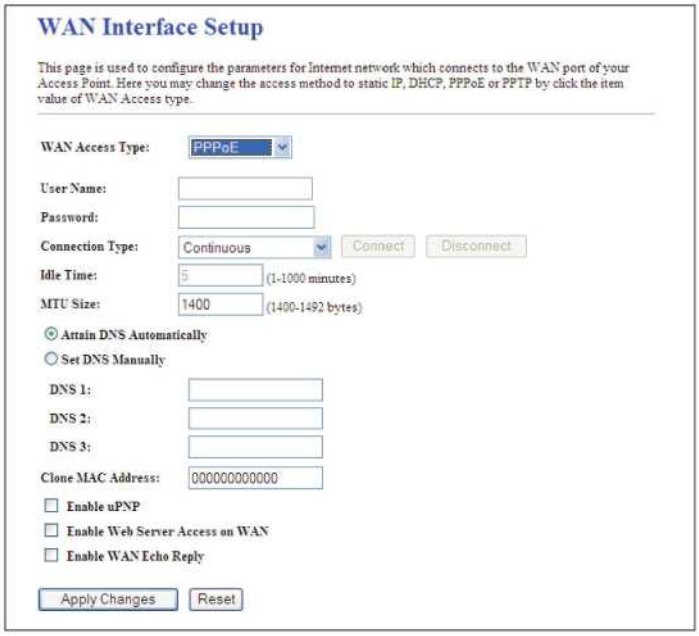
II DHCP Client


WAN Interface Setup
This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE or PPTP by click the item value of WAN Access type.
WAN Access Type:
DHCP Client
Attain DNS Automatically
Set DNS Manually
DNS 1:
DNS 2:
DNS 3:
Clone MAC Address:
000000000000
Enable uPNP
Enable Web Server Access on WAN
Enable WAN Echo Reply
Apply Changes
Reset

Screen snapshot - WAN Interface Setup - DHCP Client

Item	Description
DHCP Client	Click to select DHCP support on WAN interface for IP address assigned automatically from a DHCP server.
Attain DNS	Click to select getting DNS address for DHCP support.
Automatically	Please select Set DNS Manually if the DHCP support is selected.
Set DNS Manually	Click to select getting DNS address for DHCP support.
DNS 1	Fill in the IP address of Domain Name Server 1.
DNS 2	Fill in the IP address of Domain Name Server 2.
DNS 3	Fill in the IP address of Domain Name Server 3.
Clone MAC Address	Fill in the MAC address that is the MAC address to be cloned. Refer to 4.24 What is Clone MAC Address?
Enable uPNP	Click the checkbox to enable uPNP function. Refer to 4.22 What is Universal Plus and Play (uPNP)?
Enable Web Server Access on WAN	Click the checkbox to enable web configuration from WAN side.
Enable WAN Echo Reply	Click the checkbox to enable WAN ICMP response.
Apply Changes	Click the Apply Changes button to complete the new configuration setting.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

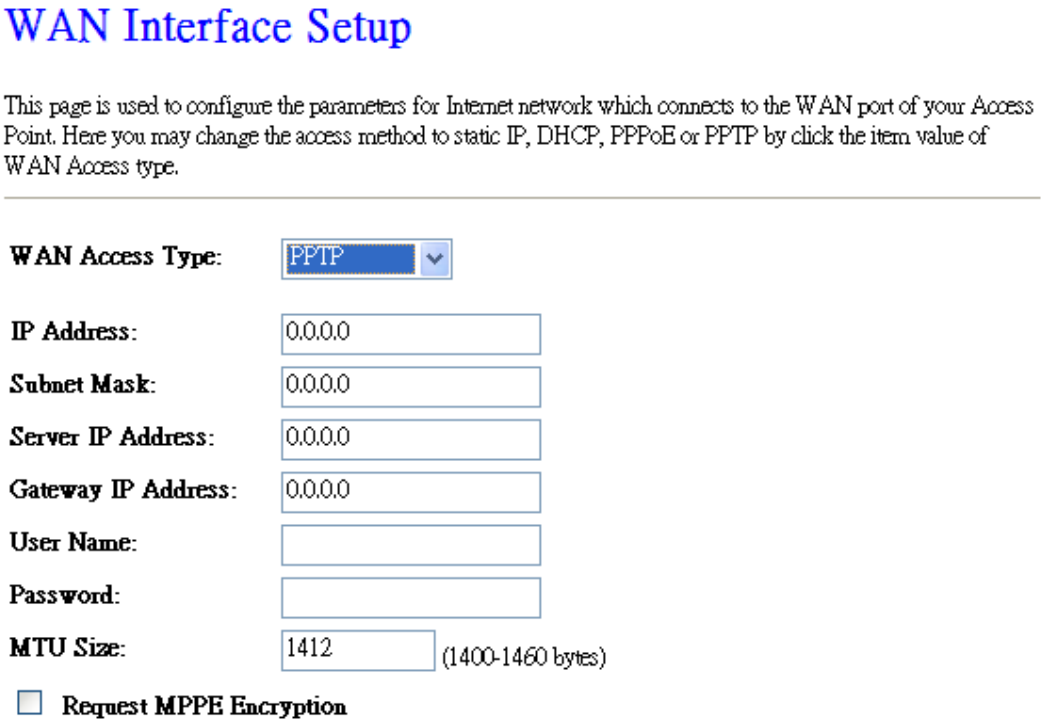
III PPPoE



Screen snapshot - WAN Interface Setup – PPPoE

Item	Description
PPPoE	Click to select PPPoE support on WAN interface. There are user name, password, connection type and idle time settings need to be done.
User Name	If you select the PPPoE support on WAN interface, fill in the user name and password to login the PPPoE server.
Password	If you select the PPPoE support on WAN interface, fill in the user name and password to login the PPPoE server.
Connection Type	Select the connection type from pull-down menu. There are Continuous, Connect on Demand and Manual three types to select. Continuous connection type means to setup the connection through PPPoE protocol whenever this WLAN AP Router is powered on. Connect on Demand connection type means to setup the connection through PPPoE protocol whenever you send the data packets out through the WAN interface; there are a watchdog implemented to close the PPPoE connection while there are no data sent out longer than the idle time set. Manual connection type means to setup the connection through the PPPoE protocol by clicking the Connect button manually, and clicking the Disconnect button manually.
Idle Time	If you select the PPPoE and Connect on Demand connection type, fill in the idle time for auto-disconnect function. Value can be between 1 and 1000 minutes.
MTU Size	Fill in the mtu size of MTU Size. The default value is 1400. Refer to 4.23 What is Maximum Transmission Unit (MTU) Size?
Attain DNS	Click to select getting DNS address for PPPoE support.
Automatically	Please select Set DNS Manually if the PPPoE support is selected.
Set DNS Manually	Click to select getting DNS address for Static IP support.
DNS 1	Fill in the IP address of Domain Name Server 1.
DNS 2	Fill in the IP address of Domain Name Server 2.
DNS 3	Fill in the IP address of Domain Name Server 3.
Clone MAC Address	Fill in the MAC address that is the MAC address to be cloned. Refer to 4.24 What is Clone MAC Address?
Enable uPNP	Click the checkbox to enable uPNP function. Refer to 4.22 What is Universal Plus and Plav (uPNP)?
Enable Web Server Access on WAN	Click the checkbox to enable web configuration from WAN side.
Enable WAN Echo Reply	Click the checkbox to enable WAN ICMP response.
Apply Changes	Click the Apply Changes button to complete the new configuration setting.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

IV PPTP


WAN Interface Setup
This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP, PPPoE or PPTP by click the item value of WAN Access type.
WAN Access Type:
PPTP
IP Address:
0.0.0.0
Subnet Mask:
0.0.0.0
Server IP Address:
0.0.0.0
Gateway IP Address:
0.0.0.0
User Name:
Password:
MTU Size:
1412
(1400-1460 bytes)
Request MPPE Encryption

Screen snapshot - WAN Interface Setup – PPTP

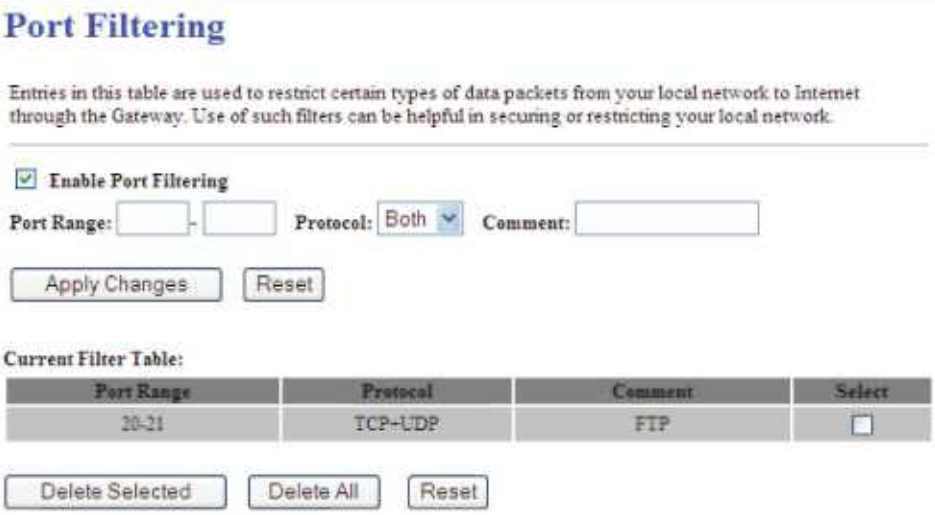
Item	Description
PPTP	Allow user to make a tunnel with remote site directly to secure the data transmission among the connection. User can use embedded PPTP client supported by this router to make a VPN connection.
IP Address	If you select the PPTP support on WAN interface, fill in the IP address for it.
Subnet Mask	If you select the PPTP support on WAN interface, fill in the subnet mask for it.
Server IP Address	Enter the IP address of the PPTP Server.
User Name	If you select the PPTP support on WAN interface, fill in the user name and password to login the PPTP server.
Password	f you select the PPTP support on WAN interface, fill in the user name and password to login the PPTP server.
MTU Size	Fill in the mtu size of MTU Size. The default value is 1400. Refer to 4.23 What is Maximum Transmission Unit (MTU) Size?
Attain DNS Automatically	Click to select getting DNS address for PPTP support.
Set DNS Manually	Click to select getting DNS address for PPTP support.
DNS 1	Fill in the IP address of Domain Name Server 1.
DNS 2	Fill in the IP address of Domain Name Server 2.
DNS 3	Fill in the IP address of Domain Name Server 3.
Clone MAC Address	Fill in the MAC address that is the MAC address to be cloned. Refer to 4.24 What is Clone MAC Address?
Enable uPNP	Click the checkbox to enable uPNP function. Refer to 4.22 What is Universal Plus and Plav (uPNP)?

Enable Web Server Access on WAN	Click the checkbox to enable web configuration from WAN side.
Enable WAN Echo Reply	Click the checkbox to enable WAN ICMP response.
Apply Changes	Click the Apply Changes button to complete the new configuration setting.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

Note: PPTP Gateway
Your ISP will provide you with the Gateway IP Address. If your LAN has a PPTP gateway, then enter that PPTP gateway IP address here. If you do not have PPTP gateway then enter the ISP's Gateway IP address above.

3.3.12 Firewall - Port Filtering

Entries in this table are used to restrict certain types of data packets from your local network to Internet through the Gateway. Use of such filters can be helpful in securing or restricting your local network.

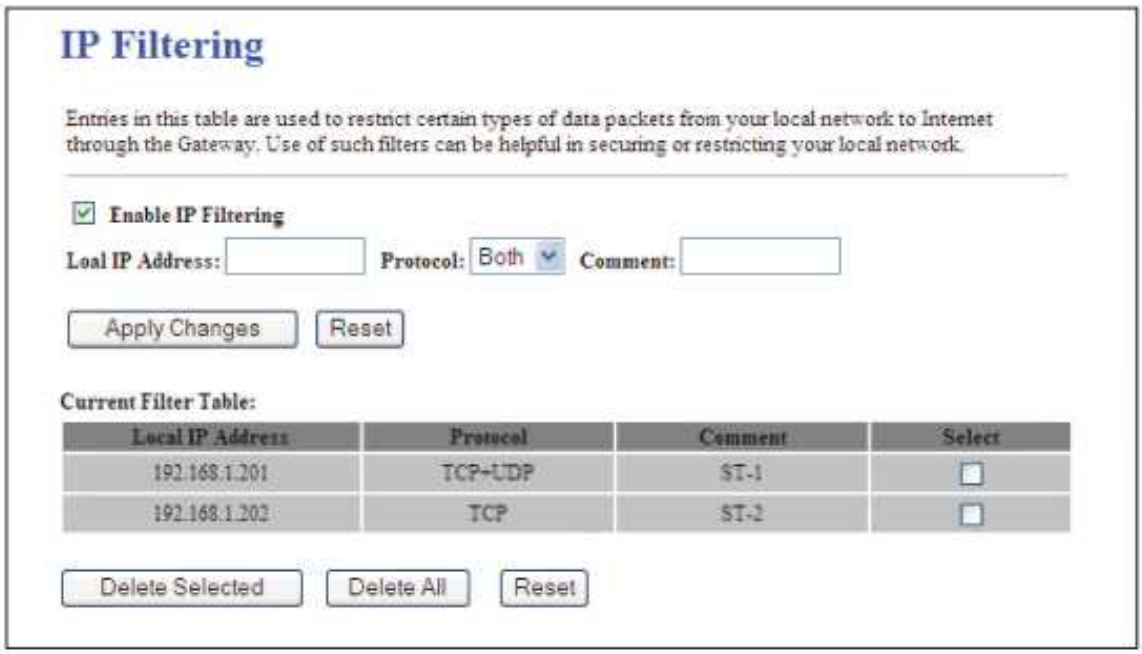


Screen snapshot - Firewall - Port Filtering

Item	Description
Enable Port Filtering	Click to enable the port filtering security function.
Port Range Protocol Comments	To restrict data transmission from the local network on certain ports, fill in the range of start-port and end-port,and the protocol, also put your comments on it. The Protocol can be TCP, UDP or Both.Comments let you know about whys to restrict data from the ports.
Apply Changes	Click the Apply Changes button to register the ports to port filtering list.
Reset	Click the Reset button to abort change and recover the previous configuration setting.
Delete Selected	Click to delete the selected port range that will be removed from the port-filtering list.
Delete All	Click to delete all the registered entries from the port-filtering list.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.13 Firewall - IP Filtering

Entries in this table are used to restrict certain types of data packets from your local network to Internet through the Gateway. Use of such filters can be helpful in securing or restricting your local network.

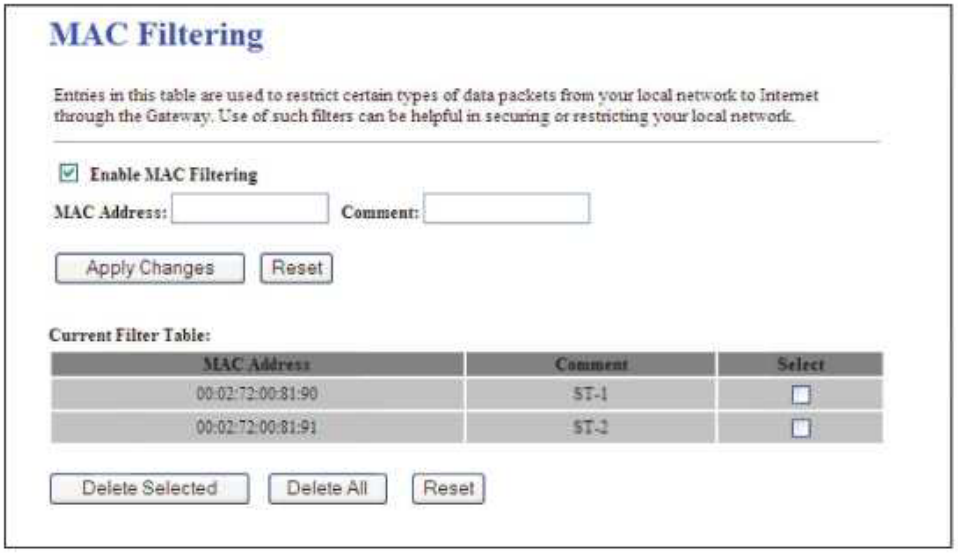


Screen snapshot - Firewall - IP Filtering

Item	Description
Enable IP Filtering	Click to enable the IP filtering security function.
Local IP Address Protocol Comments	To restrict data transmission from local network on certain IP addresses, fill in the IP address and the protocol, also put your comments on it.
Apply Changes	Click the Apply Changes button to register the ports to port filtering list.
Reset	Click the Reset button to abort change and recover the previous configuration setting.
Delete Selected	Click to delete the selected port range that will be removed from the port-filtering list.
Delete All	Click to delete all the registered entries from the port-filtering list.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.14 Firewall - MAC Filtering

Entries in this table are used to restrict certain types of data packets from your local network to Internet through the Gateway. Use of such filters can be helpful in securing or restricting your local network.

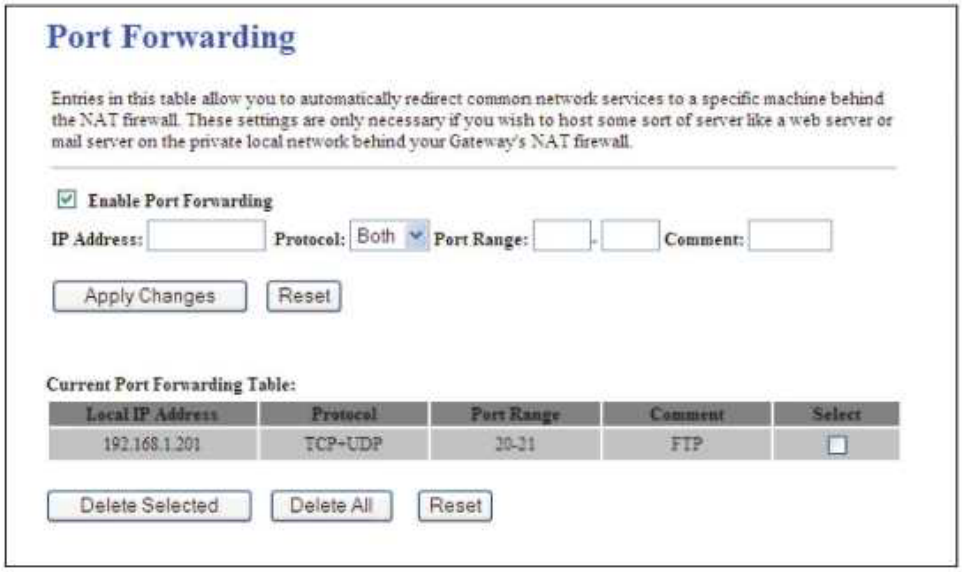


Screen snapshot - Firewall - MAC Filtering

Item	Description
Enable MAC Filtering	Click to enable the MAC filtering security function
MAC Address Comments	To restrict data transmission from local network on certain MAC addresses, fill in the MAC address and your comments on it. Comments let you know about whys to restrict data from the MAC address.
Apply Changes	Click the Apply Changes button to register the ports to port filtering list.
Reset	Click the Reset button to abort change and recover the previous configuration setting.
Delete Selected	Click to delete the selected port range that will be removed from the port-filtering list.
Delete All	Click to delete all the registered entries from the port-filtering list.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.15 Firewall - Port Forwarding

Entries in this table allow you to automatically redirect common network services to a specific machine behind the NAT firewall. These settings are only necessary if you wish to host some sort of server like a web server or mail server on the private local network behind your Gateway's NAT firewall.

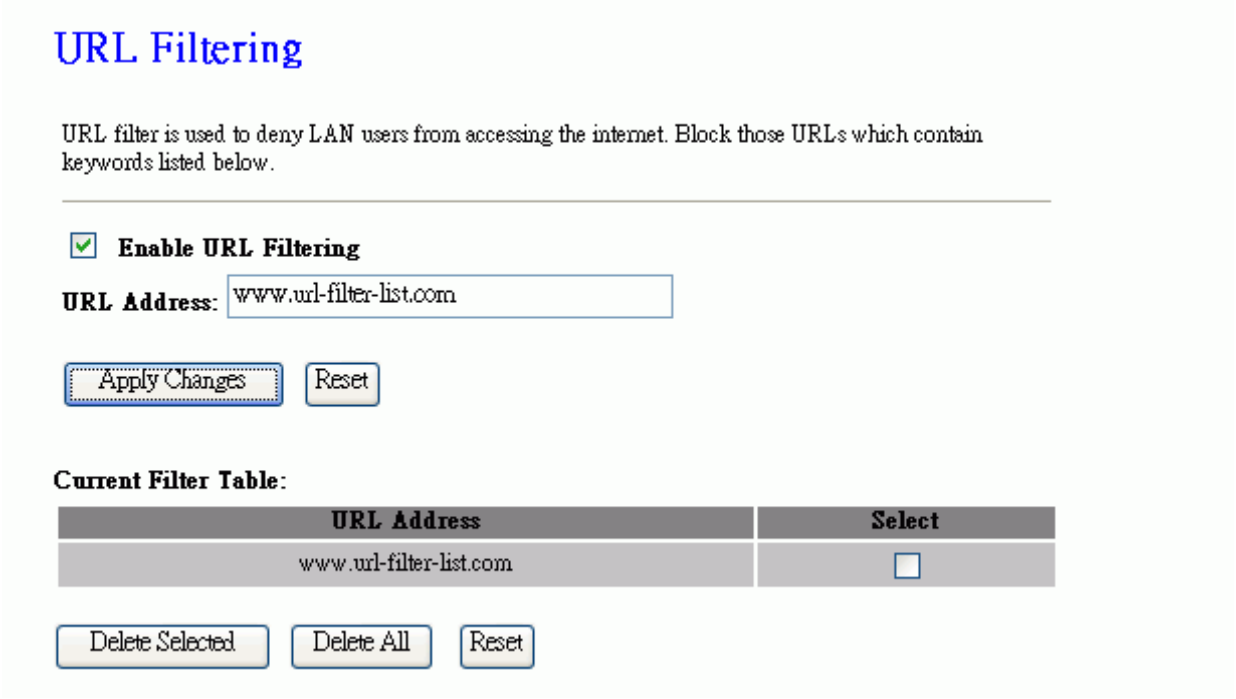

Port Forwarding
Entries in this table allow you to automatically redirect common network services to a specific machine behind the NAT firewall. These settings are only necessary if you wish to host some sort of server like a web server or mail server on the private local network behind your Gateway's NAT firewall.
Enable Port Forwarding
IP Address:
Protocol: Both
Port Range:
Comment:
Apply Changes
Reset
Current Port Forwarding Table:
Local IP Address
Protocol
Port Range
Comment
Select
192.168.1.201
TCP+UDP
20-21
FTP
Delete Selected
Delete All
Reset

Screen snapshot - Firewall - Port Forwarding

Item	Description
Enable Port Forwarding	Click to enable the Port Forwarding security function.
Local IP Address Protocol Comments	To forward data packets coming from WAN to a specific IP address that hosted in local network behind the NAT firewall, fill in the IP address, protocol, port range and your comments. The Protocol can be TCP, UDP or Both. The Port Range for data transmission. Comments let you know about whys to allow data packets forward to the IP address and port number.
Apply Changes	Click the Apply Changes button to register the ports to port filtering list.
Reset	Click the Reset button to abort change and recover the previous configuration setting.
Delete Selected	Click to delete the selected port range that will be removed from the port-filtering list.
Delete All	Click to delete all the registered entries from the port-filtering list.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.16 Firewall - URL Filtering

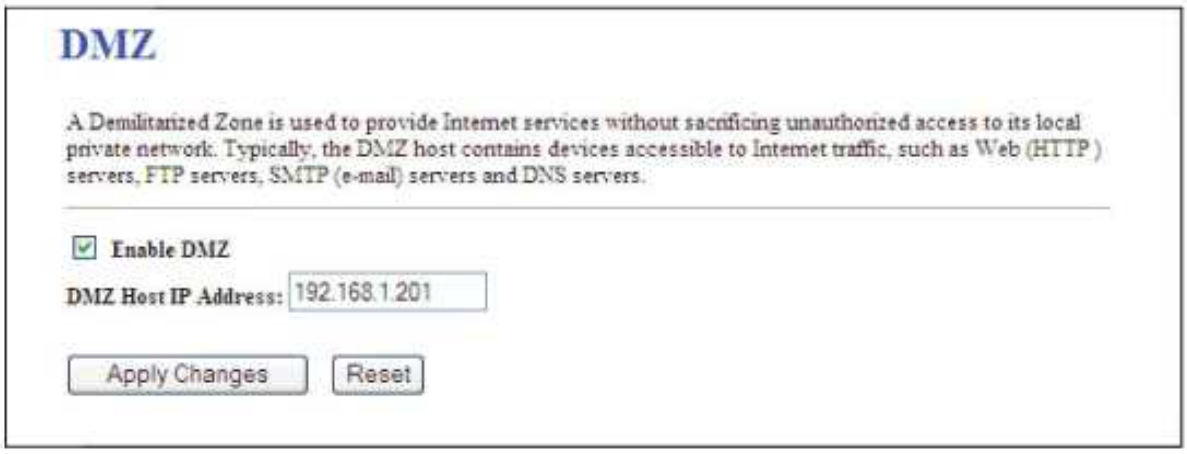
URL Filtering is used to restrict users to access specific websites in internet.



Item	Description
Enable URL Filtering	Click to enable the URL Filtering function.
URL Address	Add one URL address.
Apply Changes	Click the Apply Changes button to save settings.
Delete Selected	Click to delete the selected URL address that will be removed from the URL Filtering list.
Delete All	Click to delete all the registered entries from the URL Filtering list.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.17 Firewall - DMZ

A Demilitarized Zone is used to provide Internet services without sacrificing unauthorized access to its local private network. Typically, the DMZ host contains devices accessible to Internet traffic, such as Web (HTTP) servers, FTP servers, SMTP (e-mail) servers and DNS servers.

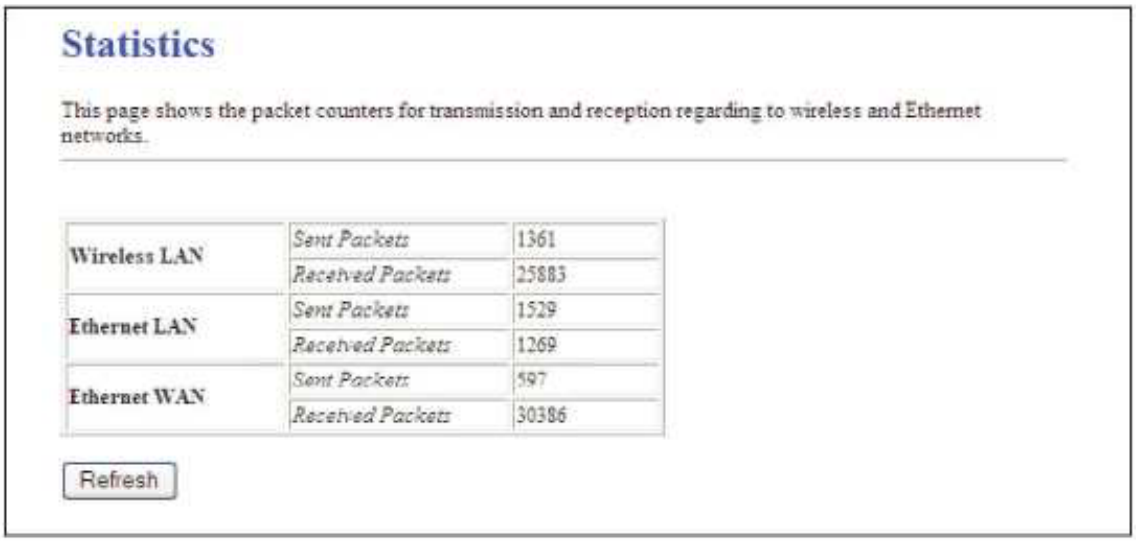

DMZ
A Demilitarized Zone is used to provide Internet services without sacrificing unauthorized access to its local private network. Typically, the DMZ host contains devices accessible to Internet traffic, such as Web (HTTP) servers, FTP servers, SMTP (e-mail) servers and DNS servers.
Enable DMZ
DMZ Host IP Address: 192.168.1.201
Apply Changes
Reset

Screen snapshot - Firewall – DMZ

Item	Description
Enable DMZ	Click to enable the DMZ function.
DMZ Host IP Address	To support DMZ in your firewall design, fill in the IP address of DMZ host that can be access from the WAN interface.
Apply Changes	Click the Apply Changes button to register the IP address of DMZ host.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.18 Management – Statistics

This page shows the packet counters for transmission and reception regarding to wireless, Ethernet LAN and Ethernet WAN networks.



Screen snapshot - Management – Statistics

Item	Description
Wireless LAN Sent Packets	It shows the statistic count of sent packets on the wireless LAN interface.
Wireless LAN Received Packets	It shows the statistic count of received packets on the wireless LAN interface.
Wireless LAN Sent Packets	It shows the statistic count of sent packets on the Ethernet LAN interface.
Ethernet LAN Received Packets	It shows the statistic count of received packets on the Ethernet LAN interface.
Ethernet WAN Sent Packets	It shows the statistic count of sent packets on the Ethernet WAN interface.
Ethernet WAN Received Packets	It shows the statistic count of received packets on the Ethernet WAN interface.
Refresh	Click the refresh the statistic counters on the screen.

3.3.19 Management – DDNS

This page is used to configure Dynamic DNS service to have DNS with dynamic IP address.

Dynamic DNS Setting
Dynamic DNS is a service, that provides you with a valid, unchanging, internet domain name (an URL) to go with that (possibly everchanging) IP-address.
Enable DDNS
Service Provider :
DynDNS
Domain Name :
host.dyndns.org
User Name/Email:
Password/Key:
Note:
For TZO, you can have a 30 days free trial here or manage your TZO account in control panel
For DynDNS, you can create your DynDNS account here
Apply Change
Reset

Screen snapshot - Management – DDNS

Item	Description
Enable DDNS	Click the checkbox to enable DDNS service. Refer to 4.25 What is DDNS?
Service Provider	Click the drop down menu to pickup the right provider.
Domain Name	To configure the Domain Name.
User Name/Email	Configure User Name, Email.
Password/Key	Configure Password, Key.
Apply Change	Click the Apply Changes button to save the enable DDNS service.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.20 Management - Time Zone Setting

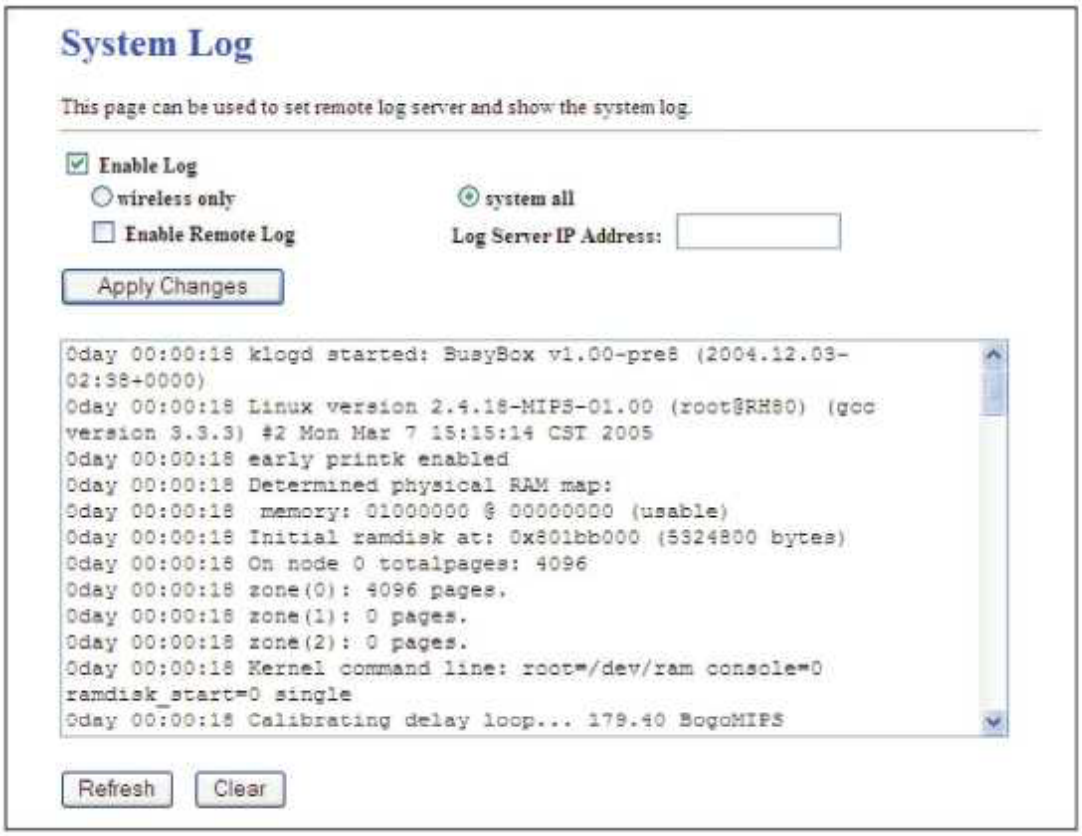
This page is used to configure NTP client to get current time.

Screen snapshot - Management - Time Zone Settings

Item	Description
Current Time	It shows the current time.
Time Zone Select	Click the time zone in your country.
Enable NTP client update	Click the checkbox to enable NTP client update. Refer to 4.26 What is NTP Client?
NTP Server	Click select default or input NTP server IP address.
Apply Change	Click the Apply Changes button to save and enable NTP client service.
Reset	Click the Reset button to abort change and recover the previous configuration setting.
Refresh	Click the refresh the current time shown on the screen.

3.3.21 Management - Log

This page is used to configure the remote log server and shown the current log.


System Log
This page can be used to set remote log server and show the system log.
Enable Log
wireless only
system all
Enable Remote Log
Log Server IP Address:
Apply Changes
0day 00:00:18 klogd started: BusyBox v1.00-pre8 (2004.12.03-02:38+0000)
0day 00:00:18 Linux version 2.4.18-MIPS-01.00 (root@RH80) (gcc version 3.3.3) #2 Mon Mar 7 15:15:14 CST 2005
0day 00:00:18 early printk enabled
0day 00:00:18 Determined physical RAM map:
0day 00:00:18 memory: 01000000 @ 00000000 (usable)
0day 00:00:18 Initial ramdisk at: 0x801bb000 (5324800 bytes)
0day 00:00:18 On node 0 totalpages: 4096
0day 00:00:18 zone(0): 4096 pages.
0day 00:00:18 zone(1): 0 pages.
0day 00:00:18 zone(2): 0 pages.
0day 00:00:18 Kernel command line: root=/dev/ram console=0 ramdisk_start=0 single
0day 00:00:18 Calibrating delay loop... 179.40 BogoMIPS
Refresh
Clear

Screen snapshot - Management – Log

Item	Description
Enable Log Wireless only System all	Click the checkbox to enable log. Only show wireless log Show all log of wireless AP router
Enable Remote Log Log Server IP Address	Click the checkbox to enable remote log service. Input the remote log IP address
Apply Changes	Click the Apply Changes button to save above settings.
Refresh	Click the refresh the log shown on the screen.
Clear	Clear log display screen

3.3.22 Management - Upgrade Firmware

This page allows you upgrade the Access Point firmware to new version. Please note, do not power off the device during the upload because it may crash the system.

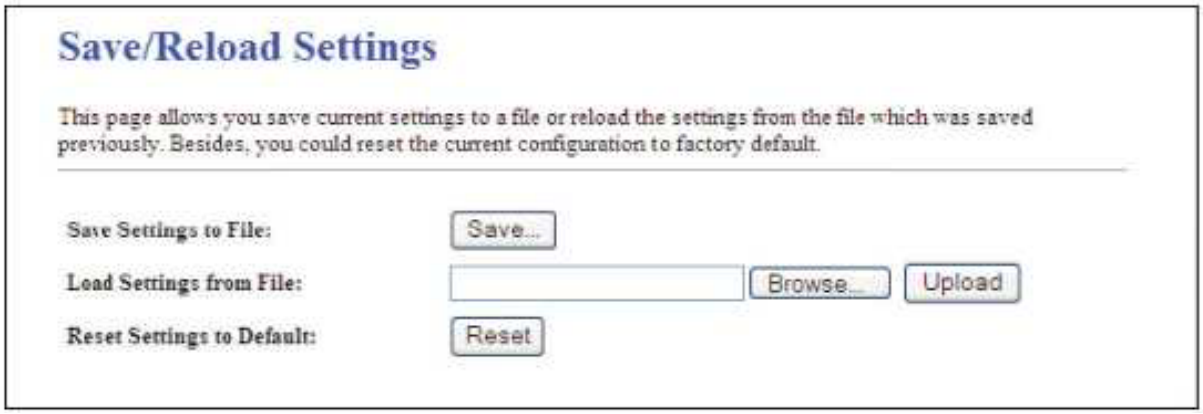
Upgrade Firmware
This page allows you upgrade the Access Point firmware to new version. Please note, do not power off the device during the upload because it may crash the system.
Select File:
Browse...
Upload
Reset

Screen snapshot - Management - Upgrade Firmware

Item	Description
Select File	Click the Browse button to select the new version of web firmware image file.
Upload	Click the Upload button to update the selected web firmware image to the WLAN AP Router.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.23 Management Save/ Reload Settings

This page allows you save current settings to a file or reload the settings from the file that was saved previously. Besides, you could reset the current configuration to factory default.


Save/Reload Settings
This page allows you save current settings to a file or reload the settings from the file which was saved previously. Besides, you could reset the current configuration to factory default.
Save Settings to File:
Save...
Load Settings from File:
Browse...
Upload
Reset Settings to Default:
Reset

Screen snapshot - Management - Save/Reload Settings

Item	Description
Save Settings to File	Click the Save button to download the configuration parameters to your personal computer.
Load Settings from File	Click the Browse button to select the configuration files then click the Upload button to update the selected configuration to the WLAN AP Router.
Reset Settings to Default	Click the Reset button to reset the configuration parameter to factory defaults.

3.3.24 Management - Password Setup

This page is used to set the account to access the web server of Access Point. Empty user name and password will disable the protection.

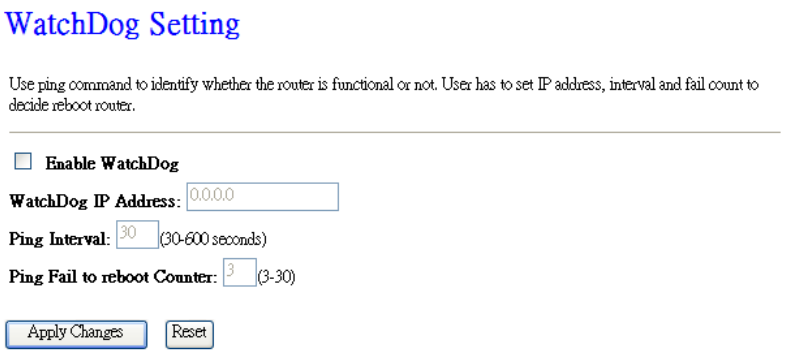
Password Setup
This page is used to set the account to access the web server of Access Point. Empty user name and password will disable the protection.
User Name:
New Password:
Confirmed Password:
Apply Changes
Reset

Screen snapshot - Management - Password Setup

Item	Description
User Name	Fill in the user name for web management login control.
New Password	Fill in the password for web management login control.
Confirmed Password	Because the password input is invisible, so please fill in the password again for confirmation purpose.
Apply Changes	Clear the User Name and Password fields to empty, means to apply no web management login control. Click the Apply Changes button to complete the new configuration setting.
Reset	Click the Reset button to abort change and recover the previous configuration setting.

3.3.25 Watchdog

Use ping command to identify whether the router is functional or not. User has to set IP address, interval and fail count to decide reboot router.

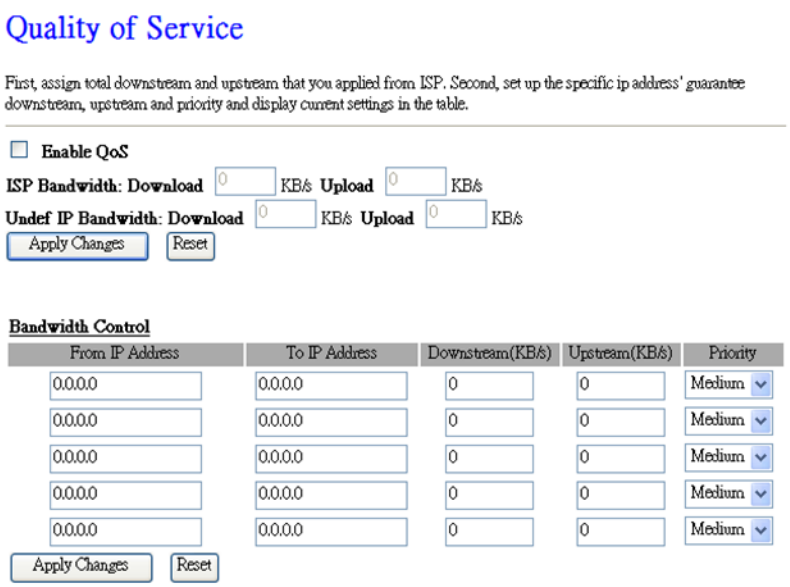

WatchDog Setting
Use ping command to identify whether the router is functional or not. User has to set IP address, interval and fail count to decide reboot router.
Enable WatchDog
WatchDog IP Address: 0.0.0.0
Ping Interval: 30 (30-600 seconds)
Ping Fail to reboot Counter: 3 (3-30)
Apply Changes
Reset

Screen snapshot - Management - Watchdog Seetting

3.3.26 Qos(Quality of Service)

The QoS can let you classify Internet application traffic by source/destination IP address and port number. You can assign priority for each type of application and reserve bandwidth for it. The packets of applications with higher priority will always go first. Lower priority applications will get bandwidth after higher priority applications get enough bandwidth. This can let you have a better experience in using critical real time services like Internet phone, video conference etc. You can adjust the priority of the rules by moving them up or down.

Note: If the total assigned bandwidth of higher priority applications is larger than the maximum bandwidth provided by the WAN port, the other applications will not get any bandwidth.


Quality of Service
First, assign total downstream and upstream that you applied from ISP. Second, set up the specific ip address' guarantee downstream, upstream and priority and display current settings in the table.
Enable QoS
ISP Bandwidth: Download 0 KB/s Upload 0 KB/s
Undef IP Bandwidth: Download 0 KB/s Upload 0 KB/s
Apply Changes
Reset
Bandwidth Control
From IP Address
To IP Address
Downstream(KB/s)
Upstream(KB/s)
Priority
0.0.0.0
0
Medium
Apply Changes
Reset

Screen snapshot - Management - Quality of Service

Item	Description
Enable/Disable QoS	You can check YEnable QoSE to enable QoS function for the WAN port. You also can uncheck “Enable QoS” to disable QoS function for the WAN port.
ISP Bandwidth	The two fields must fill in ISP’s upload and download bandwidth.
Undefined IP Bandwidth	For general IP address, the specified upload and download bandwidth fill in here. If you have any IP address need to specified in special QoS rules, please fill it in following.
Adjust QoS rule priority	You can select the priority field and drop down it to select. There are three types of priority level, “High”, “Medium” and “Low”.

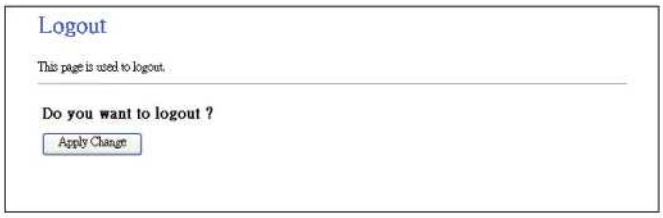
Edit QoS Rule:

You can assign packet classification criteria by its local IP range, remote IP range parameters. The parameters that you leave as blank will be ignored. The priority of this rule will be applied to packets that match classification criteria of this rule. You can limit bandwidth consumed by packets that match this rule or guarantee bandwidth required by packets that match this rule.

Item	Description
Rule Name	The name of this rule.
Bandwidth	You can assign the download or uploadbandwidth by the unit of Kbps (1024 bit per second). You can limit the maximum bandwidth consumed by this rule by selecting “Maximum”. You also can reserve enough bandwidth for this rule by selecting “Guarantee”
Local IP Address(from/to)	Enter the local IP address range of the packets that this rule will apply to. If you assign 192.168.2.3 - 192.168.2.5, it means 3 IP addresses:192.168.2.3,192.168.2.4 and 192.168.2.5
Local Port Range	Enter the local port range of the packets that this rule will apply to. You can assign a single port number here or assign a range of port numbers by assigning the first port number and the last port number of the range.

3.3.27 Logout

This page is used to logout web management page. This item will be activated next time you login after you define user account and password.



Screen snapshot - Logout - OK

Screen snapshot – Logout

Item	Description
Apply Change	Click the Apply Change button, Then click OK button to logout.

4 Frequently Asked Questions (FAQ)

4.1 What and how to find my PC's IP and MAC address?

IP address is the identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the IP address of the destination. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be zero to 255. For example, 191.168.1.254 could be an IP address.

The MAC (Media Access Control) address is your computer's unique hardware number. (On an Ethernet LAN, it's the same as your Ethernet address.) When you're connected to the Internet from your computer (or host as the Internet protocol thinks of it), a correspondence table relates your IP address to your computer's physical (MAC) address on the LAN.

To find your PC's IP and MAC address,

- ✓ Open the Command program in the Microsoft Windows.
- ✓ Type in ipconfig /all then press the Enter button.
  - ➢ Your PC's IP address is the one entitled IP Address and your PC's MAC address is the one entitled Physical Address.

4.2 What is Wireless LAN?

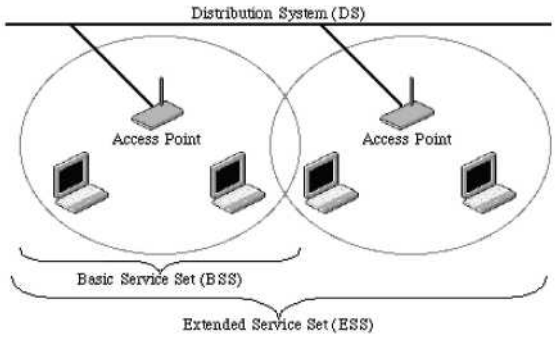
A wireless LAN (WLAN) is a network that allows access to Internet without the need for any wired connections to the user's machine.

4.3 What are ISM bands?

ISM stands for Industrial, Scientific and Medical; radio frequency bands that the Federal Communications Commission (FCC) authorized for wireless LANs. The ISM bands are located at 915 +/- 13 MHz, 2450 +/- 50 MHz and 5800 +/- 75 MHz.

4.4 How does wireless networking work?

The 802.11 standard define two modes: infrastructure mode and ad hoc mode. In infrastructure mode, the wireless network consists of at least one access point connected to the wired network infrastructure and a set of wireless end stations. This configuration is called a Basic Service Set (BSS). An Extended Service Set (ESS) is a set of two or more BSSs forming a single subnetwork. Since most corporate WLANs require access to the wired LAN for services (file servers, printers, Internet links) they will operate in infrastructure mode.



Example 1: wireless Infrastructure Mode

Ad hoc mode (also called peer-to-peer mode or an Independent Basic Service Set, or IBSS) is simply a set of 802.11 wireless stations that communicate directly with one another without using an access point or any connection to a wired network. This mode is useful for quickly and easily setting up a wireless network anywhere that a wireless infrastructure does not exist or is not required for services, such as a hotel room, convention center, or airport, or where access to the wired network is barred (such as for consultants at a client site).

Example 2: wireless Ad Hoc Mode

4.5 What is BSSID?

A six-byte address that distinguishes a particular a particular access point from others.
Also know as just SSID. Serves as a network ID or name.

4.6 What is ESSID?

The Extended Service Set ID (ESSID) is the name of the network you want to access.It is used to identify different wireless networks.

4.7 What are potential factors that may causes interference?

Factors of interference:

- Obstacles: walls, ceilings, furniture... etc.
- Building Materials: metal door, aluminum studs.
- Electrical devices: microwaves, monitors and electrical motors.

Solutions to overcome the interferences:

- Minimizing the number of walls and ceilings.
- Position the WLAN antenna for best reception.
- Keep WLAN devices away from other electrical devices, eg: microwaves,monitors, electric motors, ... etc.
- Add additional WLAN Access Points if necessary.

4.8 What are the Open System and Shared Key authentications?

IEEE 802.11 supports two subtypes of network authentication services: open system and shared key. Under open system authentication, any wireless station can request authentication. The station that needs to authenticate with another wireless station sends an authentication management frame that contains the identity of the sending station. The receiving station then returns a frame that indicates whether it recognizes the sending station. Under shared key authentication, each wireless station is assumed to have received a secret shared key over a secure channel that is independent from the 802.11 wireless network communications channel.

4.9 What is WEP?

An optional IEEE 802.11 function that offers frame transmission privacy similar to a wired network. The Wired Equivalent Privacy generates secret shared encryption keys that both source and destination stations can use to alert frame bits to avoid disclosure to eavesdroppers.
WEP relies on a secret key that is shared between a mobile station (e.g. a laptop with a wireless Ethernet card) and an access point (i.e. a base station). The secret key is used to encrypt packets before they are transmitted, and an integrity check is used to ensure that packets are not modified in transit.

4.10 What is Fragment Threshold?

The proposed protocol uses the frame fragmentation mechanism defined in IEEE 802.11 to achieve parallel transmissions. A large data frame is fragmented into several fragments each of size equal to fragment threshold. By tuning the fragment threshold value, we can get varying fragment sizes. The determination of an efficient fragment threshold is an important issue in this scheme. If the fragment threshold is small, the overlap part of the master and parallel transmissions is large. This means the spatial reuse ratio of parallel transmissions is high. In contrast, with a large fragment threshold, the overlap is small and the spatial reuse ratio is low. However high fragment threshold leads to low fragment overhead. Hence there is a trade-off between spatial re-use and fragment overhead.

Fragment threshold is the maximum packet size used for fragmentation. Packets larger than the size programmed in this field will be fragmented.

If you find that your corrupted packets or asymmetric packet reception (all send packets, for example). You may want to try lowering your fragmentation threshold. This will cause packets to be broken into smaller fragments. These small fragments, if corrupted, can be resent faster than a larger fragment. Fragmentation increases overhead, so you'll want to keep this value as close to the maximum value as possible.

4.11 What is RTS (Request To Send) Threshold?

The RTS threshold is the packet size at which packet transmission is governed by the RTS/CTS transaction. The IEEE 802.11-1997 standard allows for short packets to be transmitted without RTS/CTS transactions. Each station can have a different RTS threshold. RTS/CTS is used when the data packet size exceeds the defined RTS threshold. With the CSMA/CA transmission mechanism, the transmitting station sends out an RTS packet to the receiving station, and waits for the receiving station to send back a CTS (Clear to Send) packet before sending the actual packet data.

This setting is useful for networks with many clients. With many clients, and a high network load, there will be many more collisions. By lowering the RTS threshold, there may be fewer collisions, and performance should improve. Basically, with a faster RTS threshold, the system can recover from problems faster. RTS packets consume valuable bandwidth, however, so setting this value too low will limit performance.

4.12 What is Beacon Interval?

In addition to data frames that carry information from higher layers, 802.11 includes management and control frames that support data transfer. The beacon frame, which is a type of management frame, provides the "heartbeat" of a wireless LAN, enabling stations to establish and maintain communications in an orderly fashion.

Beacon Interval represents the amount of time between beacon transmissions. Before a station enters power save mode, the station needs the beacon interval to know when to wake up to receive the beacon (and learn whether there are buffered frames at the access point).

4.13 What is Preamble Type?

There are two preamble types defined in IEEE 802.11 specification. A long preamble basically gives the decoder more time to process the preamble. All 802.11 devices support a long preamble. The short preamble is designed to improve efficiency (for example, for VoIP systems). The difference between the two is in the Synchronization field. The long preamble is 128 bits, and the short is 56 bits.

4.14 What is SSID Broadcast?

Broadcast of SSID is done in access points by the beacon. This announces your access point (including various bits of information about it) to the wireless world around it. By disabling that feature, the SSID configured in the client must match the SSID of the access point.

Some wireless devices don't work properly if SSID isn't broadcast (for example the D-link DWL-120 USB 802.11b adapter). Generally if your client hardware supports operation with SSID disabled, it's not a bad idea to run that way to enhance network security. However it's no replacement for WEP, MAC filtering or other protections.

4.15 What is Wi-Fi Protected Access (WPA)?

Wi-Fi's original security mechanism, Wired Equivalent Privacy (WEP), has been viewed as insufficient for securing confidential business communications. A longer-term solution, the IEEE 802.Hi standard, is under development. However, since the IEEE 802. Hi standard is not expected to be published until the end of 2003, several members of the Wi-Fi Alliance teamed up with members of the IEEE 802. Hi task group to develop a significant near-term enhancement to Wi-Fi security. Together, this team developed Wi-Fi Protected Access.

To upgrade a WLAN network to support WPA, Access Points will require a WPA software upgrade. Clients will require a software upgrade for the network interface card, and possibly a software update for the operating system. For enterprise networks, an authentication server, typically one that supports RADIUS and the selected EAP authentication protocol, will be added to the network.

4.16 WhatisWPA2?

It is the second generation of WPA. WPA2 is based on the final IEEE 802.1H amendment to the 802.11 standard.

4.17 What is 802.lx Authentication?

802.lx is a framework for authenticated MAC-level access control, defines Extensible Authentication Protocol (EAP) over LANs (WAPOL). The standard encapsulates and leverages much of EAP, which was defined for dial-up authentication with Point-to-Point Protocol in RFC 2284.

Beyond encapsulating EAP packets, the 802. lx standard also defines EAPOL messages that convey the shared key information critical for wireless security.

4.18 What is Temporal Key Integrity Protocol (TKIP)?

The Temporal Key Integrity Protocol, pronounced tee-kip, is part of the IEEE 802.Hi encryption standard for wireless LANs. TKIP is the next generation of WEP, the Wired Equivalency Protocol, which is used to secure 802.11 wireless LANs. TKIP provides per-packet key mixing, a message integrity check and a re-keying mechanism, thus fixing the flaws of WEP.

4.19 What is Advanced Encryption Standard (AES)?

Security issues are a major concern for wireless LANs, AES is the U.S. government's next-generation cryptography algorithm, which will replace DES and 3DES.

4.20 What is Inter-Access Point Protocol (IAPP)?

The IEEE 802.1 If Inter-Access Point Protocol (IAPP) supports Access Point Vendor interoperability, enabling roaming of 802.11 Stations within IP subnet.

IAPP defines messages and data to be exchanged between Access Points and between the IAPP and high layer management entities to support roaming. The IAPP protocol uses TCP for inter-Access Point communication and UDP for RADIUS request/response exchanges. It also uses Layer 2 frames to update the forwarding tables of Layer 2 devices.

4.21 What is Wireless Distribution System (WDS)?

The Wireless Distribution System feature allows WLAN AP to talk directly to other APs via wireless channel, like the wireless bridge or repeater service.

4.22 What is Universal Plug and Play (uPNP)?

UPnP is an open networking architecture that consists of services, devices, and control points. The ultimate goal is to allow data communication among all UPnP devices regardless of media, operating system, programming language, and wired/wireless connection.

4.23 What is Maximum Transmission Unit (MTU) Size?

Maximum Transmission Unit (MTU) indicates the network stack of any packet is larger than this value will be fragmented before the transmission. During the PPP negotiation, the peer of the PPP connection will indicate its MRU and will be accepted. The actual MTU of the PPP connection will be set to the smaller one of MTU and the peer's MRU. The default is value 1400.

4.24 What is Clone MAC Address?

Clone MAC address is designed for your special application that request the clients to register to a server machine with one identified MAC address. Since that all the clients will communicate outside world through the WLAN AP Router, so have the cloned MAC address set on the WLAN AP Router will solve the issue.

4.25 What is DDNS?

DDNS is the abbreviation of Dynamic Domain Name Server. It is designed for user own the DNS server with dynamic WAN IP address.

4.26 What is NTP Client?

NTP client is designed for fetching the current timestamp from internet via Network Time protocol. User can specify time zone, NTP server IP address.

4.27 What is VPN?

VPN is the abbreviation of Virtual Private Network. It is designed for creating point-to point private link via shared or public network.

4.28 What is IPSEC?

IPSEC is the abbreviation of IP Security. It is used to transferring data securely under VPN.

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